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Study of Physico chemical Analysis of Terna River Water at the Polluted areain Osmanabad District Maharashtra State India

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ABSTRACT

Water pollution is the contamination of water bodies such as rivers lakes oceans & ground water. This occur when pollution are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds. The present study deal with thePhysico chemical Analysis of Teena River Water at the Polluted area in Osmanabad District Maharashtra State India.Terna river water samples were collected from five different spots in five different months in Osmanabad district (M. S.) After collection of samples six different parameters like Chloride, Sulphate, Nitrites, Dissolved oxygen, Biochemical oxygen demand, & Alkalinity were studied. Results showed that seasonal variation in water parameters at different areas. The chemical analysis of water was carried out in the light of APHA (1985) & compared with the WHO, ICMR & ISI standard.

Keywords: Physicochemical character, seasonal variation, water quality, Terna River, Five spots.

Introduction

Most water pollutants are eventually carried by the rivers into the oceans. In some areas of the world the influence can be traced hundred miles from the mouth by studies using hydrology transport models. Advanced computer models such as SWMM or the DSSAM Model have been used in many locations worldwide to examine the fate of pollutants in aquatic systems. Indicator filter feeding species such as copepods have also been used to study pollutant fates in the New York Bight, for example. The highest toxin loads are not directly at the mouth of the Hudson River, but 100 kilometers south, since several days are required for incorporation into planktonic tissue. The Hudson discharge flows south along the coast due to Coriolis force. Further south then are areas of oxygen depletion, caused by chemicals using up oxygen and by algae blooms, caused by excess nutrients from algal cell death and decomposition. Fish and shellfish kills have been reported, because toxins climb the food chain after small fish consume copepods, then large fish eat smaller fish, etc. Each step up the food chain concentrates certain toxins like heavy metals and DDT by approximately a factor of ten. The big gyres in the oceans trap floating plastic debris. The North Pacific Gyre for example has collected the so-called *Great Pacific Garbage Patch* that is now about the size of Texas. Many of these long-lasting pieces wind up in the stomachs of marine birds and animals. Many chemicals undergo reactive decay or change especially over long periods of time in groundwater reservoirs. A noteworthy class of such chemicals is the chlorinated hydrocarbons such as trichloroethylene (used in industrial

metal degreasing) and tetrachloroethylene used in the dry cleaning industry. Both of these chemicals, which are carcinogens themselves, undergo partial decomposition reactions leading to new hazardous chemicals. Groundwater pollution is much more difficult to abate than surface pollution because groundwater can move great distances through unseen aquifers.

Materials & Methods

The water samples of Terna River were collected from five different spots i.e. from Wanewadi, Ternanagar, Takdi, Boregaon&Bebli of Osmanabad district in polythene bottle of capacity 1 to 2 liter in the month of December 2009 to April 2010. The water samples were analyzed to access the physico chemical parameters. The standard procedure was adopted for the determination of physico- chemical parameter given by APHA (1989)&Trivedy&Goel (1986). Each sample was analyzed for important physico- Chemical parameter such as Chloride, Sulphate, Nitrites, Dissolved oxygen, Biochemical oxygen demand, & Alkalinity.

RESULT AND DISCUSSION

Physicochemical analysis of river water from different five spots of TernaRiver from month December 2009 to April 2010 is shown in table no. 1 to 5 which shows that

1) Chloride:-

Chloride content in fresh water are largely influenced by evaporation and precipitation P.C. Mishraand et al; (1989). It was troublesome anion in the irrigation water these are generally more toxic than sulphate to most of the plants and are best indicator of water pollution. K. Vijayram et al; (1990) and H. Raj et al; (1979) at all spots. The maximum value of chloride was recorded at spot no. 5 in every month it may be attributed due to domestic waste discharged in the village. Chloride content at all sampling spots in every month is below desirable limit.

2) Sulphate: - It is naturally ions in all kinds of natural water. Biological oxidation of reduced solphur species to sulphate increases its concentration. Rainwater has quite higher concentration of sulphate particularly in the areas with high atmospheric pollution discharge of agriculture run off and domestic sewage in waters tends to increase its concentration. It may undergo transformation to sulphur and hydrogen sulphide depending upon the redox potential of the water R. K. Trivedy et al; (1984)the maximum value of sulphate is recorded at spot No. 5 in every month. It is below the Desirable limit in each case.

3) Nitrite: -

Nitrite is formed in water by oxidation of ammonium compounds or by reduction of Nitrate. In the present investigation spot no. 5 has maximum nitrite level in all months as compared to spot no. 1,2,3 and 4

4) Dissolved oxygen (DO): -

Dissolved oxygen level in the nature and waste water depend upon the physical chemical and biological activates in the water body. It is a key test in water pollution and treatment process control. Desirable limit for DO is 7mg/ lit. However in present investigation spot no. 1, 2 and 3 have approximate same DO values as that of desirable limit while spot no. 4 and 5 have DO value below the Desirable limit in every month.

Thus spot No. 4 and 5 shows higher pollution level of the river water.

5) Biochemical oxygen Demand (BOD):-

Biochemical oxygen Demand values also indicated the degree of pollution S.R. Mishra et al; (1990). It was show an inverse relationship with DO and COD BOD represents the biochemical oxidisable loads present in water. D.G. Dhuley et al; (2000) water body with BOD level exceeding 8ppm is considered to be polluted. D.M. Martin et al;

The maximum BOD is recorded at spot No. 5 in every month the maximum BOD content may be attributed domestic sewage water added from the village. Such observation have been reported by other workers also L.W. Richared

(1996) and D.P. John et al; (1952)

6) Total Alkalinity: -

The determination of total alkalinity gives total carbonates bicarbonates and hydroxides. Total alkalinity is the sum of phenolphthalein alkalinity and methyl orange alkalinity. In present investigation spot No. 4 and 5 are showing values above the desirable limit while spot no. 1, 2 and 3 are within the limits in every month. The high alkalinity may be attributed to domestic and Industrial waste waters entering the river wastages from Dhobi Ghat are also actively involved in increasing the alkalinity.

Table 1 Physico- Chemical Analysis Of Terna River (December 2009)

Parameter	Wanewadi	Ternanagar	Takdi	Boregaon	Bembli
Chlorides (mg/lit.)	31.70	40.50	48.90	64.33	75.33
Sulphate (mg/lit.)	48.0	70.50	82.20	95.40	103.20
Nitrites (mg/lit.)	0.001	0.001	0.02	0.02	0.03
DO (mg/lit.)	6.00	5.66	5.23	4.31	4.0
BOD (mg/lit.)	2.02	3.10	4.49	5.12	6.20
Alkalinity (mg/lit.)	125.0	132.0	140.0	205.0	259.0

Table 2Physico- Chemical Analysis of Terna River (January 2010)

Parameter	Wanewadi	Ternanagar	Takdi	Boregaon	Bembli
Chlorides (mg/lit.)	20.30	29.45	50.20	60.80	85.20
Sulphate (mg/lit.)	52.0	74.50	86.60	99.40	107.50
Nitrites (mg/lit.)	0.02	0.02	0.02	0.02	0.03
DO (mg/lit.)	6.80	6.80	5.50	4.21	4.0
BOD (mg/lit.)	3.20	4.02	5.30	6.0	7.02
Alkalinity (mg/lit.)	126.0	158.0	180.0	204.0	242.0

Table 3Physico- Chemical Analysis OfTerna River (feberuary2010)

Parameter	Wanewadi	Ternanagar	Takdi	Boregaon	Bembli
Chlorides (mg/lit.)	18.0	24.50	45.6	65.60	105.66
Sulphate (mg/lit.)	55.0	78.80	88.8	103.20	110.50
Nitrites (mg/lit.)	0.01	0.01	0.02	0.02	0.03
DO (mg/lit.)	4.21	4.21	4.00	3.60	2.90
BOD (mg/lit.)	3.20	4.02	5.83	6.23	7.42
Alkalinity (mg/lit.)	127	153	190	237	280

Table 4Physico- Chemical Analysis ofTerna River (March 2010)

Parameter	Wanewadi	Ternanagar	Takdi	Boregaon	Bembli
Chlorides (mg/lit.)	18.0	25.0	43.20	80.10	103.22
Sulphate (mg/lit.)	61.30	80.0	90.50	105.50	115.2
Nitrites (mg/lit.)	0.001	0.001	0.01	0.02	0.03
DO (mg/lit.)	5.23	4.33	4.33	3.52	3.0
BOD (mg/lit.)	3.22	4.0	6.00	6.93	7.78
Alkalinity (mg/lit.)	135.0	183.0	221.0	296.0	340.0

Table 5 Physico- Chemical Analysis ofTerna River (April 2010)

Parameter	Wanewadi	Ternanagar	Takdi	Boregaon	Bembli
Chlorides (mg/lit.)	17.0	20.30	47.70	86.90	120.50
Sulphate (mg/lit.)	66.60	88.50	96.60	110.30	120.88
Nitrites (mg/lit.)	0.001	0.01	0.01	0.02	0.03
DO (mg/lit.)	4.25	4.25	3.90	3.60	3.01
BOD (mg/lit.)	3.40	4.20	5.66	6.75	7.93
Alkalinity (mg/lit.)	140	167.0	214.0	290.0	380.0

Conclusion

Analysis of five different samples from five different spot for five consecutive months indicates that degree of pollution increases as the river reaches heart of the village. Similarly the rise in degree of pollution is also observed as we go from autumn to summer. Samples in the autumn season are showing lower degree of pollution while these in summer are showing higher degree of pollution

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