

GODAVARI RIVER WATER POLLUTION DUE TO THE INDUSTRIAL EFFLUENTS FROM M.I.D.C. NANDED, MAHARASHTRA, INDIA

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ABSTRACT

The present investigation deals with the study of COD Chemical content of Godavari river water due to impact of MIDC effluents. The water is greatly used for domestic agricultural and recreational purposes. The investigations were carried out for the period of two years during Feb.-98 to Jan.-2000. Chemical Oxygen Demand is the oxygen required by the organic substances in water systems to oxidize them by a strong oxidizing agent. It is an index of organic content of water. Chemical oxygen demand test can be used in finding out the toxic conditions and biologically resistant substances.

INTRODUCTION

COD is the oxygen required by the organic substances in water system to oxidize them by a strong oxidizing agent. It is the test used for measurement of pollution strength of industrial and domestic waste. The pollution strength can be ensured in terms of quantity of O₂ required for the oxidation of organic matter there by producing CO₂ & H₂O. All the organic compounds with some exception can be oxidized using strong oxidizing agent under acidic conditions.

COD has advantage over BOD because COD determination requires about 5 hrs. as compared to BOD which requires 5 days. COD is important in the management and design of treatment plant because of its rapidity in determination COD value can be used in finding out the toxic conditions and

presence of biologically resistant substances. It is a poor measure of organic matter as oxygen is also consumed in the oxidation of the inorganic matter.

Oxygen demanding wastes

One of the most important water quality parameter is the amount of dissolved oxygen (DO) present. The value of DO in water is modest, i.e. 8 to 15 mg/L. depending on temperature and salinity. Minimum amounts required for a healthy fish population may be as high as 5-8 mg/L. for active species, such as trout or as low as 3 mg/L. for less desirable species, such as carps.

METHODOLOGY

The samples were collected from three sampling

stations A, B & C monthly. On specific date of each and every month at fixed morning time to avoid interference of other factors. Samples were collected in clean polythene bottles by standard methods suggested by APHA (1989). The values of chemical oxygen demand were estimated by dichromate digestion method.

The three sampling stations are, Station - A is situated at water filtration tank “Dankin’ before entering Godavari in Nanded city. Station- B is situated near old bridge and Station - C is situated near Wadgaon where M.I.D.C. effluents are drained in River Godavari by nala without any treatment.

RESULTS

In the present investigation values of COD were recorded. The maximum COD values were recorded in summer and lowest during monsoon. The values of COD recorded during the year 1998-1999 at Station-A 2.44 to 130.6 mg/L and at Station-B 48.2 to 235 mg/L and at station C 50.2 to 240 mg/L. During the year 1999-2000 the values of COD recorded are at station A 25.9 to 132.6 mg/L at Station - B 496 to 236 mg/L and at station - C are 518 to 242 mg/L.

The values of COD are given in the Table 1 & 2 and Fig. 1 & 2.

DISCUSSION

During COD determination the organic matter is converted into CO₂ and H₂O. This test is useful to determine toxic conditions and the presence of biologically resistant substances. In the present investigation the higher levels of COD during summer in the month of May and lower during the monsoon.

It seems that temperature and water table influences COD values. Not only temperature but some of the fatty acids chloride, nitrates and iron are the main interfering radicals which influences the COD values. Similar trends were reported by Kudesia *et al.* (1986) and Qummerunnisa (1985).

The COD and BOD values are higher during summer than in monsoon and winter. Similar trend was observed by Kathari *et al.* (1981). Pulle, (2000) recorded the COD values in the range between 60.00mg/L to 148.00mg/L in Islapur Dam. Sharma *et al.* (2000) recorded the maximum COD values from Yamuna river at Mathura, where the river receives

a huge quantity of sewage, animal waste and other substances. Singh *et al.* (1998) recorded COD values from Rapit river at Gorakhpur ranging from 7.1 to 8.5 mg/L Deshmukh *et al.* (1998) recorded COD values from Kham river water ranging from 23 to 40 mg/L Sultana *et al.* (1999) recorded COD values from Godavari river water ranging from 22 to 30 mg/L.

The COD values of drinking water should not exceed more than 10 mg/L as per guidelines of World Health Organisation (WHO). The values of COD for drinking water were recorded beyond the permissible level in both the year.

In the present investigation the COD values are higher compared to standard values of WHO & I.C.M.R. which indicates greater pollution of Godavari river water due to M.I.D.C. effluents it rejects the utility of river water for potable use, recreational and history. Therefore if is necessary

Table 1. Monthly Mean Values of C.O.D. (mg/L) from Godavari River water Samples during the Year 1998-99.

Month	Station-A	Station-B	Station-C
February	37.1	52.2	58.6
March	40.8	92.4	98.2
April	40.3	100	144
May	130.6	235	240
June	42.2	98	102
July	24.4	50.8	56.2
August	26.2	48.2	50.2
Sept.	30.1	50.8	68.3
October	31.2	60.3	61.2
Nov.	33.1	64.4	69.1
December	34.2	75.1	81.3
January	30.8	84.2	88.3

Table 2. Monthly Mean Values of C.O.D. (mg/L) from Godavari River Water Samples during the Year 1999-2000.

Month	Station-A	Station-B	Station-C
February	38.2	54.1	59.0
March	41.9	93.6	99.8
April	40.8	102	145
May	132.6	236	242
June	43.4	100	104
July	25.9	51.9	57.4
August	27.5	49.6	51.8
Sept.	32.4	52.4	69.8
October	34.0	61.6	62.6
Nov.	35.4	65.2	70.8
December	34.2	76.1	83.5
January	31.6	85.1	89.6

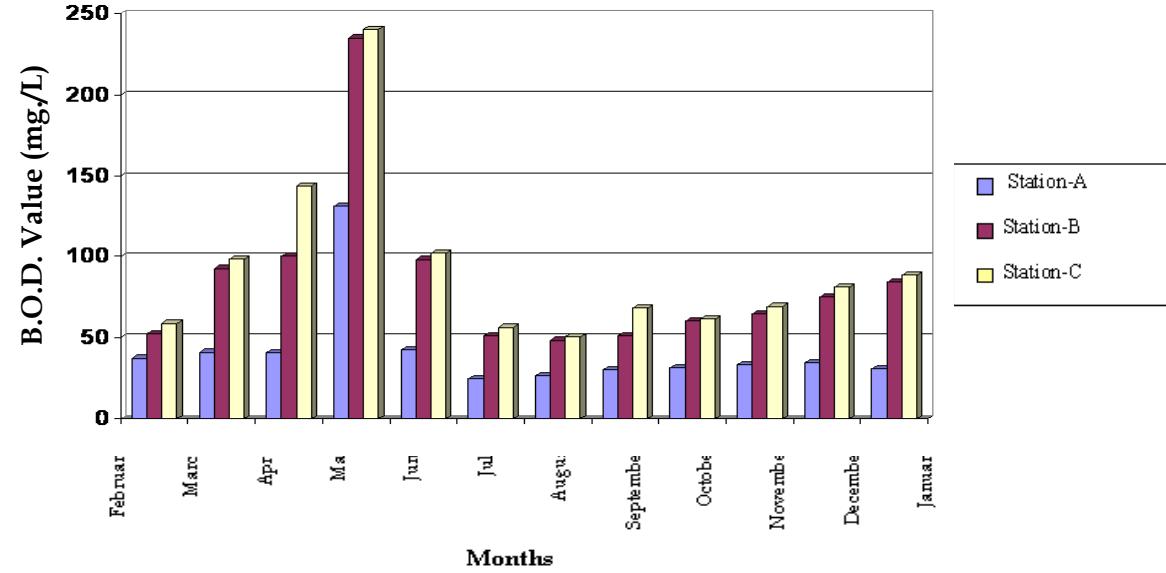


Fig. 1 Monthly Mean values of C.O.D. (mg./L) from Godawari River Water Samples During the year 1998-1999

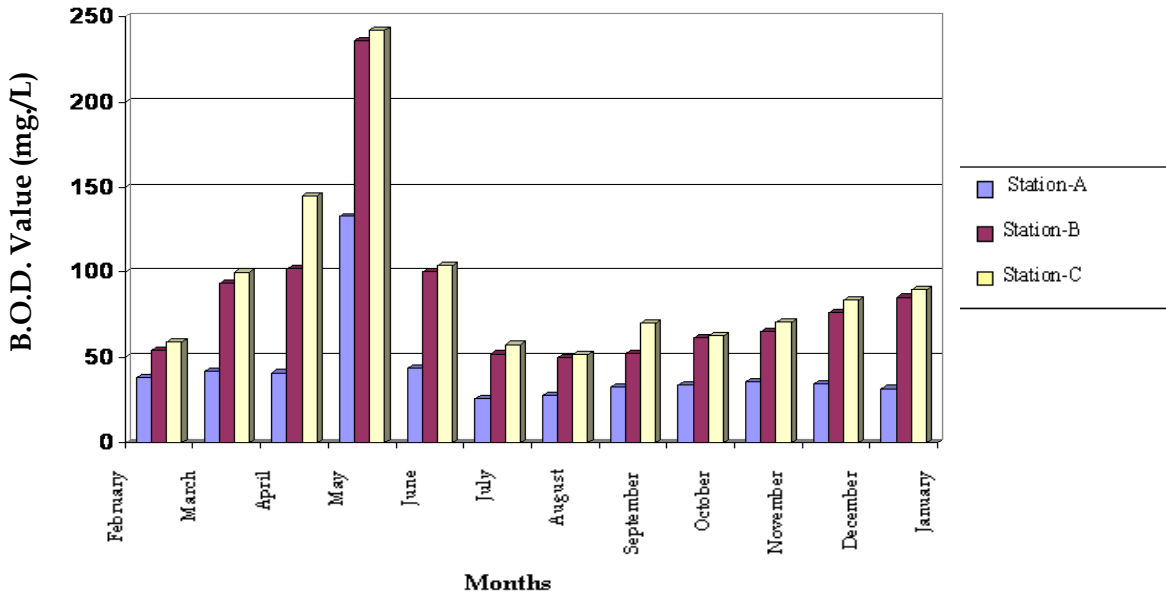


Fig. 2 Monthly Mean values of C.O.D. (mg/L) from Godawari River Water Samples During the year 1999-2000

to discharge the M.I.D.C. effluents after proper treatment by authorities of industries.

CONCLUSION

It is concluded that the river water shows higher concentration of BOD in Godavari river. In the month of April and May the water from old bridge

and Wadgaon, i.e., at Station-B and Station-C were unfit for public supply, drinking bathing, fish culture and irrigation. Therefore, it is necessary to discharge the M.I.D.C. effluents after proper treatment by the authorities of the industries.

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REFERENCES

- Adebisi, A.A. 1981. The physico- chemical hydrology of a tropical seasonal river, upper Orgun river Nigeria. *Hydrobiol.* 79 (2) : 157-165.
- Chaturvedi, Y.N. 1985. Observations of pollution of river Yamuna in U.P. *Civic Affairs.* 32 (11) : 71-75.
- Chuhan, A. 1989. Impact of distillery effluents on river Vainganga and self purification M.S. Accs. by *Env. Hlth* NEERI, Nagpur.
- Datar, M.O. *et al.* 1992. Physo-chemical aspects of pollution in river Betwa. *Indian Jr. Envior. Prot.* 12 (8) : 557-580.
- Dutta, S.P.S. *et al.* 2001. Hydro biological studies on river Basanter, Samba Jammu. *A.J. Aqua, Biol.* 16 (1) : 41-44.
- Israili, A.W. *et al.* 1993. Chemical characteristics of river Yamuna from Dehradun to Agra. *Indian J. Enviorn. Hlth.* 356 (3) : 199 - 204.
- Jayaraju, P.B. *et al.* 1994. Seasonal variations in physicochemical parameters and diversity in the flora and fauna of the river Munnerd a tributary to river Krishan, Andhra Pradesh, India. *J. Aqua. Biol.* 9 (1 & 2) : 19-22.
- Kapoor, *et al.* 1993. Physicochemical and biological study of four river at Bareilly (U.P.) *Poll. Res.* 72 (4) : 267-270.
- Gill, S.K. and Sahota, S.K. 1993. Physicochemical parameter examination of river Satalj. *Indian J. Environ Prot.* 13 (3) : 171-175.
- Narayan, S. and Rajeev Chauhan, 2000. Water quality status of river Yamuna at Panchananda Dist. Etawah U.P. *Poll Res.* 19 (3) : 357-364.