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STUDY OF BIOCHEMICAL OXYGEN DEMAND IN GODAWARI RIVER AT NANDED CITY DUE TO IMPACT OF INDUSTRIAL POLLUTION

J.U. DESHMUKH [1], R.P. MALI [2] AND N.E. AMBORE [3]

Department of Zoology Yeshwant Mahavidyalaya, Nanded, 431 602 M.S. India

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ABSTRACT

Origin of Godavari is at Trimbakeshwar near Nasik. It is the main source of water for peoples living on the bank of the river. Nanded is one of those cities on the bank of Godavari, so it is called as life line of the Nanded City. It is an accepted fact that hydrobiological quality through out the planet earth is under going deterioration at an alarming rate and the stress of induced pollution is the sole cause. Remedial measures are the demand of the day.

INTRODUCTION

The present investigation was undertaken to study the BOD in Godawari river for a period of two years effluents from M.I.D.C. at Nanded City (M.S.) the effect of industrial effluents on BOD level of Godawari river water is studied. Higher BOD values due to high organic matter which utilize DO for oxidation of organic matter.

BOD is defined as the amount of oxygen required by micro-organisms while stabilizing biologically decomposable organic matter in a waste under aerobic conditions. The BOD test is widely used to determine the degree of pollution. Efficiency of water treatment methods NEERI 1988.

The BOD test may be considered as wet oxidation procedure in which the living organisms serve, as the medium for oxidation of organic matter CO_2 and water. A quantitative relationship exist between the amount of oxygen required to convert a amount of given organic compound to CO_2 water & NH_3 (Sawyer & Mocarty, 1978).

BOD is an important parameter that indicates the magnitude of water pollution by the oxidisable organic matter and the oxygen used to oxidize inorganic material such as sulphides and ferrous ions (APHA 1971)

Potential Pollutants in Industrial Wastes

Industrial effluents generated from paper and other industries are accompanied by very high load with BOD values ranging from 2500 to 12200 ppm. The paper & pulp industrial waste contents lignin which is made up of cellulosic material and remains unattended by microbes for long time causing depletion of fishes up to as long as 40 Km. distance in the down stream.

The present investigations was carried out to study

***Authour for correspondence -** Dr. Jayashri Uttamrao Deshmukh, Chikhalwadi Corner, Gate No. 2, Near Jakrewale's House, House No 3-4-29,Pannu Niwas Nanded 431 601, M.S., **Email :** deshmukh.jayashri@gmail.com

BOD of Godavari river during the year 1998-2000, at Nanded (M.S.) because as not much work has been done on BOD of river. For convenience, three sampling stations A, B & C from the river were selected.

High BOD values during summer induce the high growth of bacteria (Pyatkin *et al.*, 1980). Low BOD values in winter due to lesser quantity of total solids as well as to the quantitative number of population, (Rice, 1938; Zafar 1986). The highest BOD values during mansoon was possibly due to high quantity of organic matter and industrial effluents (Rice, 1938).

METHODOLOGY

The samples for the analysis of BOD were collected for 24 months from Feb. 1998 to January 2000. Water analysis was performed following winklers method in NEERI (1986).

The samples were collected on specific dates and at specific time, from Singh (1998), recorded BOD values from Rapti river at Gorakhpur at site at site A 1.9 mg/L at site-B 1.9 to 38.7 mg/L and at site-C 1.9 to 31.5 mg/L. Minimum values during winter and maximum values during summer.

Deshmukh *et al.* (1998) recorded values from Kham river range from 2.60 to 26.5 mg/L.

RESULT

The BOD test may be considered as a wet oxidation procedure in which the living organisms serve as the medium for oxidation of organic matter to CO_2 & water. A quantitative relationship exist between the amount of oxygen required to convert a definite amount of any given organic compound to CO_2 water & ammonia (Sawyer & McCarty, 1978).

In the present investigation the value of BOD were observed maximum during summer. During the year 1998 to 1999 these values at station – A 4.0 to 6.2 mg/L. at station B 48.0 to 64.0 mg/L. The values of BOD during summer. At station A, B & C are highest due to industrial effluents drained into Godavari river. The values are given in Table 1 & 2. The Fig. 1. to 2.

DISCUSSION

The BOD indicates amount of organic matter present in polluted water due to that that it can be decomposed by bacteria under aerobic conditions. The BOD test is widely used to determine degree of pollution of river water Efficiency of waste water treatment methods NEERI – 1988.

From river Godavari at Nanded city from the observations it was concluded that the values are well above the permissible level in all seasons at all stations. The permissible level of BOD in potable water is 6 mg/L suggested by WHO.

The highest BOD during monsoon was possibly, due to presence of high amount of organic matter brought in river by surface run off. The phytoplankton population in the water is also decreased.

Singh (1997) recorded the BOD values ranging from 1.4 to 11.2 mg/L from river Ganga at Patna Dubey (1997) recorded BOD values between 12 to 16.8 mg/L in Narmada river.

Shivnikar (1998) recorded the BOD values at different station in Godavari river at station A 3.6 to 16 mg/L at station B 40.4 to 67.0 mg/L and at station

Table 1. Monthly Mean Values of B.O.D. (mg/L) from Godavari River Water Samples during the year 1998-99

Month	Station-A	Station-B	Station-C
February	5.5	55.0	62.0
March	5.8	57.0	64.0
April	6.0	59.0	65.0
May	6.2	64.0	69.0
June	4.0	59.0	57.0
July	3.6	52.0	55.0
August	4.2	56.0	58.0
September	5.5	60.0	62.0
October	6.0	50.0	52.0
November	5.8	48.0	50.0
December	6.0	49.0	49.0
January	6.2	52.0	50.0

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

Month	Station-A	Station-B	Station-C
February	5.7	56	58
March	6.0	58	60
April	6.2	60	62
May	6.4	62	65
June	4.4	61	68
July	3.8	54	57
August	4.6	55	56
September	5.8	62	64
October	5.2	54	56
November	5.0	50	52
December	5.2	51	52
January	5.5	54	55

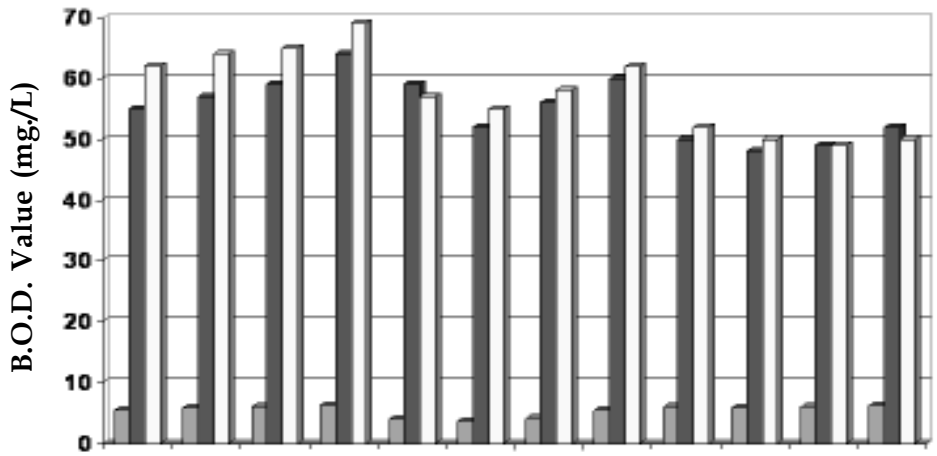

Fig. 1 Monthly Mean values of B.O.D. (mg./L) from Godawari River Water Samples During the year 1998-99

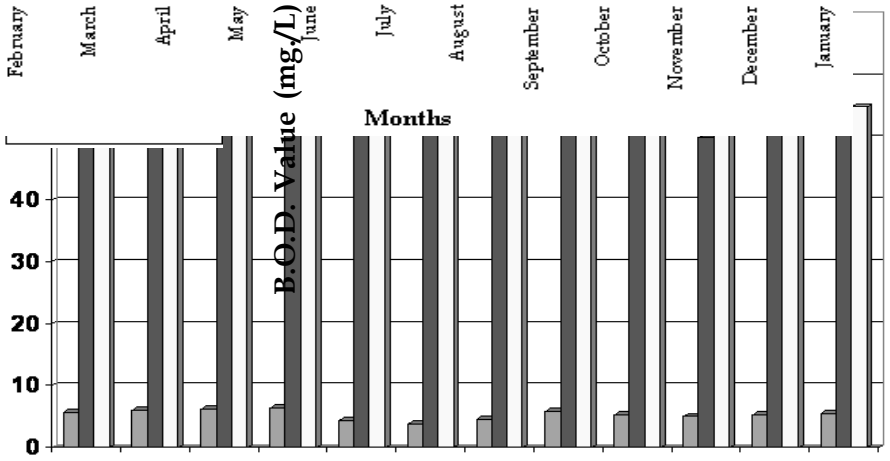

Fig. 2 Monthly Mean values of B.O.D. (mg/L) from Godawari River Water Samples During the year 1999-2000

C 57 to 69 mg/L. These observation shows that the BOD values from river Godavari were well above permissible level in all seasons.

Reddy *et al.* (1994), recorded the mean BOD values as 4.0 mg/L from river Niva. Joshi *et al.* (1995) in western Ganga river Haridwar BOD was recorded in the range of 0.12 to 3.9 mg/L. Kulkarni *et al.* (1995) noted BOD values were found in the range of 2.8 to 5.36 mg/L from Sadatpur reservoir.

Singh, (1998), recorded BOD values from Rapti river at Gorakhpur at site A 1.9 mg/L at site-B 1.9 to 38.7 mg/L and at site-C 1.9 to 31.5 mg/L. Minimum values during winter and maximum values during summer.

Deshmukh *et al.* (1998) recorded values from Kham river range from 2.60 to 26.5 mg/L.

CONCLUSION

It is concluded that the river water shows more 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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