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HEAVY METAL POLLUTION OF GODVARI RIVER DUE TO INDUSTRIAL EFFLUENTS FROM M.I.D.C. NANDED, MAHARASHTRA INDIA.

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Key words : Godavari river, Water pollution, Industrial effluents, Heavy metal, Iron.

ABSTRACT

The study deals with Godavari river water pollution at Nanded due to M.I.D.C. effluents disposal in Godavari river without any treatment. Many textile, Dairy, Fertilizer, tin and drug industries are located in M.I.D.C. area and they are generating large amount of eflluents. Water was analysed from three sampling stations for various physico-chemical parameters. All parameters except DO are in higher concentration, most of them are above the permissible limits and are responsible for Godavari river water pollution. Due to presence of heavy metal like iron in water, the water is not fit for drinking. Free iron is toxic because it can chemically catalyse the oxidation of lipids and other biomolecules. It often tastes unpalatable due to presence of precipitated ferric hydroxide.

INTRODUCTION

Godavari water plays an important role in the life of peoples and animals on the bank of the river Godavari. It is widely used as a source of water for drinking, irrigation and other purposes. The industrial water have great potential for polluting the water. The industrial wastes may have pollutants of almost all kinds ranging from simple nutrient and organic matter to complex loxic substances. The induslrial effluent affecls the river water quality, which is not useful for drinking and agricultural purpose.

The presence of iron in drinking water supplies is objectionable for a number of reasons. Under Ihe high pH conditions existing in drinking water supply, ferrous sulphate, is unstable and precipitates as insoluble ferric hydroxide, which settles out as a rust coloured silt. Such water often tastes unpalatable even at low concentrations (0.3 mg.L) and stains loundry and plumbing fixtures. The iron that settls out in the distribution system gradually reduces the flow of water.

The physiological functioning of iron involves controlled oxidation reduction reaction. Free iron is toxic because it can chemically catalyse the oxidation of lipids and other biomolecules. Speicfic binding proteins control, extracellular transport and intracellular storage. Three quarters of the typical 4 gms body content of iron in Hb, myoglobin and iron containing enzymes. Virtually all of the rest is in storage and transport proteins.

Table 1
Monthly mean values of iron (mg/L) from Godavari river water samples during the Year 1998-99

Month	Statio n-A	Station-B	Slalion-C
February	3.06	4.00	5.40
March	3.95	4.02	5.65
April	3.28	4.95	5.74
May	5.74	6.05	6.28
June	3.28	4.00	5.05
July	1.13	2.25	3.(W
August	1.32	2.50	3.25
September	1.35	3.20	3.68
October	1.60	3.40	3.80
November	1 .35	3.05	3.(H)
December	1.37	3.09	3.48
January	0.80	2.00	2.02

Table 2
Monthly mean values of iron (mg/L) from Godavari river water samples during the Year 1999-2000

Month	Station-A	Station-1	Station-C
February	3.20	4.02	5.60
March	3.80	4.10	5.80
April	3.35	4.98	6.00
May	5.00	6.02	6.40
June	3.00	4.05	5.25
July	1.02	2.50	128
August	1.15	3.40	3.35
September	1.30	3.55	3.90
October	1.50	3.20	3.96
November	1.45	3.10	3.15
December	1.40	3.25	3.50
'January	1.55	1.88	1 .55

MATERIALS AND METHODS

Nanded is District place in Maharashtra many textile. Drug, Dairy, Fertilizer and Sipta comet (Tin industry) industries are located in industrial area of Nanded (M.I.D.C.).

The Godavari river water is collected from three sampling stations. Station - A is present before entering Godavari river in Nanded city, at water filtration tank 'Dankin' Station - B is situated near old bridge. 8 km from Station - A and Station - C at Wadgaon. 10 km from station - B station B & C are receiving industrial effluents by nala.

Samples were collected during the year 1998-1999 and 1999-2000 monthly in morning (i.e. at 8 a.m.) time on specific date. The samples were collected by using standard method. Suggested by APHA (1985).

RESULTS

In the present investigation the vlaucs of iron during the year 1998-1999 are as follows At Station - A 0.80 to 5.74 ing/L., at station -B 2.0 to 6.05 mg./L and at station -C 2.02 to 6.28 mg/L. During the year 1999-2000 the values are at station - A 1.02 to 5.00 mg/L, at staion - B 1.88 to 6.02 mg/L and at staion - C 1.55 to 6.40 mg/L.

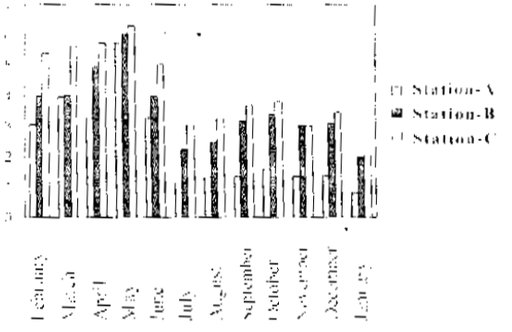

Fig. 1

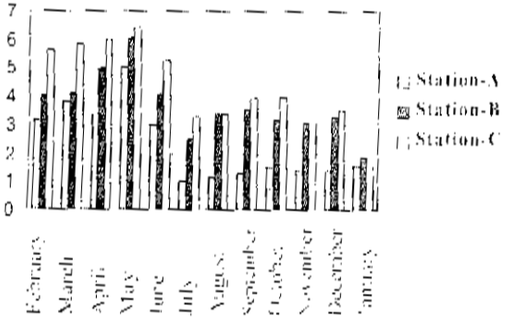

Fig. 2

The monthly mean values of iron are more than the permissible level which affect life. The monthly mean values arc given in the Table 1 to 2 and Fig. 1& 2

In the present investigation during both the year the values of iron are higher during summer in the month of may and minimum in the winter in the month of January.

DISCUSSION

The long term exposure to heavy metals is responsible for health problems. Among the vital phisiological functions which are affected by heavy metal in blood production and liver function. Ingestion of traces of heavy metals by way of water or food can lead to more complex situations like metal poisoning for which appropriate medical care is required.

Singh *et al.* (1989) observed the iron concentration 0.975 ppm to 1.575 ppm in the river Subcrnrekha al Ghatshila. Pallah *et al*. (1991) studied the trace metal content in groundwatcr and reported that maximum and minimum concentration of iron was 6.697 mg/L and 0.150 mg/L respectively. The iron concentration of this water should be well above the permissible limit

Gogoi *et al*. (1991) analysed the dissolved iron in the drinking water of Duliajan of Dibrugrh district of Assam. and reported in iron in the range of 0.3 to 4.8 mg/L.

Joseph (1994) observed the level of iron as high as 0.04 mg/L and low 0.01 mg/L. In the Anicut reservoir Tamilnadu. Kirshanamurthy and Bharati (1994) studied the distribution of iron in the surface waters of Kali river around Dandcri (Karnataka). The river is highly polluted and contains high cone, of iron. Venkateshwarlu *el al*. (1994) studied ihc iron content from ihe river Moosi.

In the river Tungabhadra it was recorded as 6.41 mg/L. and 0.29 mg/L Ragunathan *et al*. (2000) recorded iron range from 0..296 to 0.096 ing /L from Palar river al vellorc town. Bhalerao *et al*. (2000) reocrded iron range 0.2 lo 1.0 mg/L from lakes in tribal area of Maharashtra. Gupta *et al.* (2001) recorded iron range from 0.165 lo 0.450 mg/L from Udaisagar lake Chamundeshxvari Devi *el al*. (2001) recorded iron range from 0.92 to 4.25 mg/L.

AKNOLEDGEMENT

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