

## ZINC AND LEAD HEAVY METAL POLLUTION OF RIVER GODAVARI AT NANDED DUE TO MIDC EFFLUENTS, MAHARASHTRA, INDIA

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### ABSTRACT

River Godavari is called as southern Ganga but when it is through its course get polluted due to domestic sewage, agricultural waste and industrial effluents which are directly drained into river Godavari without any treatment. It results in severe pollution of river water. Heavy metals like Zinc and Lead present in excessive quantity results in health hazards. Three samples were collected from three sampling stations of river Godavari. The values of zinc and lead are above permissible units. So the water is not fit for drinking and irrigation purpose.

**KEYWORDS:** Co-bio-logical cycle, enzyme activity Godavari Water pollution, Heavy metals, Health hazards, Lead, Effluents, Water quality, Zinc.

### INTRODUCTION

Heavy metals today have a great ecological significance due to their toxicity accumulative behavior (Purves, 1985). These elements contrary to most pollutants, are not biodegradable and undergo a global eco-bio-logical cycle (Nurnberg 1984) in which natural waters are the main pathways. Pardo *et al.*, (1990) state that the determination of concentration levels in these water as well as the elucidation of chemical forms in which they appear as prime target in environmental research today. River Godavari is one of the main river of Maharashtra., originates from Trimbakeshwar at Nasik. During its course, it gets heavily polluted by domestic sewage, agricultural runoff and untreated industrial effluents. Therefore the concentrations of these heavy metals were determined in water and sediment of the river. In 1934 it was shown to be essential for normal growth and development of mammals, and is present to the extent of 1.4 to 2.3 gms. in human body. The metals are necessary in small quantities but their excessive quantities in water results in water pollution. Lead in low quantity necessary for enzyme activity but excess values than the potable level causes health hazards.

### MATERIALS AND METHODS

Nanded is district place in Maharashtra State, India. Textile Godavari Drug, Fertilizer, Dairy, Cement and Sipta commet industries are located in M.I.D.C. area Nanded. The water samples were collected with standard sampling method from three sampling stations. The samples collected, filtered and acidified immediately for decreasing pH to prevent loss of metals through adsorption on the walls and precipitation. Station A is present at water filtration tank. Station B near old bridge and Station C near Wadgaon. Station B and C receiving industrial effluents by nalas. The samples were collected in clean Glass bottles twice in the month for five months, on fixed time. The samples were analyzed in the laboratory by using atomic absorption spectro- photometer according to standard methods proposed by APHA (1988).

### RESULTS AND DISCUSSION

In the present investigation maximum Zinc is recorded in the month of May due to low water table and increased industrial effluents. During the year 2007 the Zinc values recorded at sampling station A is 2.90 to 7.60 mg/lit. at Station B 5.80 to 12.10 mg/ lit and Station C 6.10 to 13.80 mg./ lit. During the year 2007 the lead values recorded at sampling station A is 0.062 to 0.132 mg./lit. At Station B 0.080 to 0.315mg/lit. and at Station C 0.090 to 0.420 mg/ The monthly mean Values of Zinc and lead are given in the Table 1 and 2.

Heavy metals are considered major sources of pollution in the natural waters. These have received considerable attention because of their inherent toxicity to the living aquatic forms. Biksham et al (1991) reported that the suspended and bed sediments collected from the entire region of the Godavari river basin were analyzed for zin. The concentrations of Zinc in the suspended sediments are significantly higher than the bed sediments. The maximum concentration was recorded is 2650 ug/ gm from the Godavari basin. However both bed sediment and suspended

sediments showed great variations in the concentration of Zinc. Rao and Viraraghavan (1991) reported the concentration of Zinc in waste water is 1 Omg/li i. Chandra Harish et al (1991) studied the drinking water quality during Mahakumbha Mela at Allahabad during January and February recorded the zinc concentration 0.02 mg/lit. in the city. Brij Mohan *et al.*, (1991) did the analysis of heavy metal pollution in aquatic environment of Kadrabad drain, Modinagar, observed the range of zinc between 3.8 to 8.2 mg/ lit.

**Table 1. Monthly twice mean values of Zn in mg/lit During the yr. 2007**

Month	Station-A	Station- B	Station -C
Jan	4.86	9.20	9.45
Feb	4.98	9.84	9.98
Mar	5.28	10.60	10.82
Apr.	6.92	11.75	11.94
May	7.56	11.90	13.40
June	7.60	12.10	13.80
July	2.90	5.80	6.10
Aug	3.20	6.00	6.40
Sept	3.60	6.30	7.10
Oct	3.90	6.75	7.45
Nov	4.10	7.10	8.20
Dec	4.55	7.80	9.00

**Table 2. Monthly mean values of Pb (lead) in mg/lit During the yr. 2007**

Month	Station-A	Station- B	Station -C
Jan	0.150	0.090	0.110
Feb	0.062	0.160	0.172
Mar	0.082	0.195	0.248
Apr.	0.098	0.282	0.382
May	0.120	0.294	0.398
June	0.132	0.315	0.420
July	0.05	0.080	0.090
August	0.065	0.092	0.100
Sept	0.070	0.098	0.112
Oct	0.076	0.120	0.134
Nov	0.089	0.150	0.150
Dec	0.150	0.090	0.110

Baruach *et al.*, (1993) observed the concentration of zinc in the river Gelabil range from 0.25 mg/lit to 10.0 mg/lit. Bhosale (1998) recorded zinc values from river Godavari at Nanded range from 6.50 to 9.00 mg/lit. Trivedy and Khatavkar (1990) studied water quality of Krishna and Koyana G.M.S. India lead ranges from 0.040 to 2.130 mg/lit and zinc range from 0.030 to 1.950 mg/lit.

Trivedy and Nakate (1989) studied water quality from river Panchganga at Ichalkaranji (M.S.) India, Zinc values ranges from 0.030 to 0.900 and Ajmal *et al.*, (1985) studied the Zinc concentration from Kabnoor drian range from 0.170 to 1320 mg/lit, suggested by WHO. Zinc is essential in May metallo enzymes. Its deficiency causes Dwarfism, hypogonadism, haemolytic anemia, sickle cell disease, loss of appetite, slow wound healing. Excess quantity of Zinc is toxic to plants at higher levels and disagreeable taste to Water; Zinc fever (chills) nausea, edema of lungs. Potable value of Pb is 0.1 mg/lit proposed by WHO in present investigation values are higher than permissible level. High doses for centuries are a cumulative general metabolic poison. Some of the acute effects of poisoning are tiredness, slight abdominal discomfort, irritability, and anemia and in children's behavioral changes lead and at low levels can reduce the activity of enzymes.

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