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# HEAVY METAL ANALYSIS IN THE WATER BODIES NEAR AND AROUND THE INDUSTRIAL AREAS OF CHITTOOR DISTRICT, ANDHRA PRADESH

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## ABSTRACT

With the aim of assessing the level of heavy metal pollution, study was conducted through analysis of heavy metal levels in different water samples in the industrial areas of Chittoor district, Andhra Pradesh (A.P).  The sample sites were mainly the ponds, drainage, bore well and well waters from the industrial areas of Kallur, KallurMalladi, NallapalyamCheruvu, Chenampalle, Otturu, Gajulamandyam and Ekambarakuppam in Chittoor district of A.P.  The results indicated Arsenic, Borm, Copper, Nickel and Zing like heavy metals were below the desirable limit and the metals like selenium, manganese, lead, iron, chromium hexavalent, cadmium were above the desirable limit. No trace of mercury in any industrial area was observed.  Based on the results it is reported that as certain heavy metal concentration in some industrial areas is above the desirable limit, clinical studies to check their impact on the flora and fauna is warranted.

**Number of Table**: 1                     **Number of References**: 4

## INTRODUCTION

Most of the pollutants exist in the environment at extremely low concentration levels and in order to characterize them, for clinical diagnosis, treatment and search for permanent solution their analytical metrology is highly essential (Brooks, 1977, Khopkar, 1993). Heavy metals generally have strong affinity towards biological tissues, and their elimination from biological system is found to be very slow (Sinha et al., 2010). Prolonged contact with these metals may lead to serious damages to human beings, vegetation, animals and other living entitles (Cloud, 1986). As a consequence this topic is getting wide attention of environmental analytical scientists and other challenges to them, to analyze various industrial effluents like heavy metals in the environment. With this background the present study is designed to analyze the heavy metal concentration in various industrial areas of Chittoor district of Andhra Pradesh (A.P), India.

## MATERIALS AND METHODS

The study areas selected for the study were Kallur pump water, KallruMalladi drugs, Nallapalyamcheruvu, Neelchempeta, Kottakalva, Gajulamandyam and EkambaraKuppam. In these areas factories like sugars, pharmacy, granite, alloy casting, distilleries are established. These industries use to release effluents like heavy metals into surrounding water bodies. The water samples from the above cited industrial areas were collected from ponds, drainage bore well and well and

were numbered as 1 to 7. Samples collected with suitable care were sent to Hyderabad Micro Testing Labs Pvt. Ltd for analysis and the data of heavy metals present in sample 1 to 7 was presented in table-1.The data in table-1 shows that the heavy metals like arsenic, boron, copper, nickel and zinc were below the desirable level concentration and the metals like selenium, manganese, lead, iron, chromium, cadmium were found to be above the desirable limit. No traces of mercury were observed in many industrial effluent samples in the studied areas. From the results it can be construed that there exists heavy metal effluent pollution threat in the areas selected for the present study. Concerning to the effluent treatment in the majority of the industries is virtually non-existent in the areas selected for the current study. Only a few industries have installed the simplest pollution control equipment such as sedimentation, sand filtration or oil and grease traps for effluent scrubbers and particulate traps orprecipitators for gaseous emissions. Regrettably, most of the treatment facilities where they exist are grossly inadequate to cope up with the volume and type of effluent generated by the various industries of Chittoor district of A.P. Even the above cited effluent treatment facilities were found to be poorly maintained or broken down completely. In short, what we have today, as treatment facilities are environmentally unacceptable. Though the present study denotes the concentration of heavy metals in the water bodies their impact on the public health, however needs clinical evaluation.

**Table1:** *Concentration of heavy metals in the water bodies near and around the industrial areas of Chittoor District of Andhra Pradesh.*

| S.No. | Parameter | 1. Kalluru pump water | 2. Kalluru near malladi drugs | 3. Nallapalyamcheruvu | 4.Neelchem peta/ chenampalle | 5. Atturu/ othakalvaS.T.Colony | 6. Gajulamandyam | 7. Ekambarakuppam | IS:10500 Desirable limit |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Arsenic | 0.02 | 0.01 | 0.03 | 0.03 | 0.04 | 0.01 | 0.01 | 0.05 |
| 2. | Boron | 0.06 | 0.04 | 0.21 | 0.08 | 0.08 | 0.08 | 0.08 | 1.0 |
| 3. | Cadmium | 0.02 | 0.01 | 0.02 | 0.05 | 0.05 | 0.03 | 0.03 | 0.01 |
| 4. | Chromium | 0.38 | 1.52 | 0.57 | 1.72 | 1.91 | 0.19 | 1.33 | NS |
| 5. | Chromium Hexavalent | 0.16 | 0.70 | 0.20 | 1.1 | 1.2 | 0.05 | 0.80 | 0.05 |
| 6. | Copper | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.02 | 0.05 |
| 7. | Iron | 0.4 | 0.6 | 0.2 | 0.9 | 0.9 | 0.9 | 0.9 | 0.3 |
| 8. | Lead | 0.14 | 0.19 | 0.08 | 0.19 | 0.31 | 0.05 | 0.02 | 0.05 |
| 9. | Manganese | 0.2 | 0.3 | 0.5 | 0.2 | 0.2 | 0.6 | 0.6 | 0.1 |
| 10. | Mercury | Nil | Nil | Nil | - | - | - | - | 0.001 |
| 11. | Nickel | 0.08 | 0.12 | 0.04 | 0.37 | 0.04 | 0.02 | 0.12 | NS |
| 12. | Selenium | 0.04 | 0.02 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 13. | Zinc | 0.47 | 0.14 | 0.07 | 0.08 | 0.12 | 0.08 | 0.08 | 5.0 |

*Each value is the mean of 3 individual samples.*

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