

Effect of Metal Pickling and Electroplating Industrial Sludge-Borne Heavy Metals on Wheat (*Triticum aestivum*) Seedling Growth

1 Sudarshana Sharma, 2 Parmanand Sharma, 3 Sazada Siddiqui 2 A. K. Bhattacharyya

1 Department of Biochemistry, Bundelkhand University Jhansi, India 2 School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India 3 Department of Botany, Bundelkhand University Jhansi, India pnsjnu@gmail.com

Abstract :

A pot culture study has been undertaken to evaluate the effect of rolling and pickling industrial sludge

amendments on growth response and bioaccumulation of heavy metal in wheat seedlings. Processed acidic wastewas first treated with three doses of lime (0, 0.5 and 1%) and then mixed with two soils in different ratios (0, 10 and 20%). Samples were filled in earthen pots (2Kg/pot) one week before planting and seven days old wheat seedlings (3 per pot) were transplanted in these pots and pots were kept in glass house. Temperature of glass house was maintained at 22±20C and moisture contained at 50% of water holding capacity. DTPA extractable heavy metals and metals in seedlings increased with increasing doses of industrial sludge amendments. Biomass and growth has been also found to increase with increasing rate of sludge. Lime enhanced the biomass and reduced the heavy metal concentrations. Although 20% treatments in both soils showed a significant enhancement in shoot length but metals like Pb was found beyond permissible limit. The heavy metal in wheat seedlings follow the trend Zn>Pb>Cu>Cd. Lime has a negative correlation with availability and uptake of heavy

metals. Results showed that application of lime treated industrial sludge to soil could be useful in order to increase crop growth in the glass house. [Nature and Science 2010;8(3):1-8]. (ISSN: 1545-0740).

Key Word :

pot culture, industrial waste, bioaccumulation, DTPA extractable metals

Volume 8, Number 3, March 2010 , ISSN 1545-0740