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PREPARATION OF VERMICOMPOST MANURE USING *EISENIA FOETIDA* SAVIGNY AND ITS REMEDIATION AGAINST LEAD TOXICITY IN *PENNISETUM GLAUCUM* L.

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Abstract:

The present study centered on assessing the remediation rendered by the vermicompost manure prepared using *Eisenia foetida* against the lead toxicity induced in *Pennisetum glaucum* crop. The chemical profiling of vermicompost manure performed by GC-MS resulted in hundreds of compounds like Triisopropylsilyl 7-(tributylstannyl)hepta-3E,6E-dienoate, Trifluoroethane-2,2-D2, Trisulfide, dipropyl, Ethyl(Z/E)-4-Benzoyloxy-3-((1R,5R,7R,8S)-8-methoxymethoxy-3,3-dimethyl-2,4,6-trioxabicyclo[3.3.0]octan-7-yl)but-2-enoate, 2,2,4,4,6,6-Hexa-tert-butylcyclotrisilazane, 2,6-bis(Dibromomethyl)-3,5-diphenyl-4H-pyran-4-one, bis(2,2-dibromo-1-chlorovinyl)ether and so on. The effect of different concentrations of lead nitrate say 50 – 150 ppm on the rate of seed germination of *Pennisetum glaucum* was assessed which resulted in a concentration dependent decrease in the seed germination rate. The maximum germination rate of 78.66% was observed at 25 ppm whereas the least rate of germination was observed at 150 ppm concentration of lead nitrate. The *in vivo* protective effect of vermicompost manure over *Pennisetum glaucum* against lead toxicity was also studied. Physiological parameters namely root length, shoot length, leaf length, number of rootlets and leaflets were found to be highly depleted in groups treated with 50 and 100 ppm of lead nitrate. Lead nitrate had the potential to decrease the activities of enzymatic antioxidants like Superoxide dismutase (SOD) and Catalase (CAT) in *Pennisetum glaucum* with a simultaneous increase in lipid peroxidation which assures the oxidative stress imparted by lead toxicity to the plant. This decrease in antioxidant status got altered back to normal values on remediating with vermicompost manure. The vermicompost manure treated groups showed a significant increase in the activities of SOD and CAT along with a decrease in the level of lipid peroxides. This could be because of the protective effect rendered by the vermicompost manure against lead toxicity.

Keywords: *Eisenia foetida*; *Pennisetum glaucum*; Vermicompost manure; Lead toxicity