B-56: Influence of cadmium on ecotoxicity of sewage sludge amended soils in North Eastern Scotland

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Numerous techniques have been developed to monitor soil pollution with heavy metals. Microbial biosensors are advantageous in soil ecotoxicity testing. This technique appears to be a rapid and flexible assay for monitoring the pollution of soil and fresh water environments. The objective of this study was to monitor short term changes in ecotoxlcity of a soil amended with Cd-spiked sewage sludge.

The experiment was laid out on a CRD design with 3 replicates. Three different rates of cadmium i.e. 1.5, 3.0 and 6.0 mg Cd/kg dry soil were compared with the control. Soil solution was extracted using Rhizon soil moisture samplers during the experiment and were analysed for Cd concentration by Electro-thermal atomic absorption spectrophotometry. It was also subjected to the luminescence-based bacterial (*Pseudomonas fluorescens* 10586s/pUCD607) assay on a Bio-Orbit 1251 luminometer at different times of exposure, i.e. 5, 15, 30 ,40, and 60 minutes.

Results indicated that, soil solution Cd concentration gradually declined from 135 ng/ml at day 1 to 30ng/ml at day 30 for the highest Cd level. At the beginning the trend was for the % bioluminescence compared to the zero spike control to be appreciably higher in solutions of Cd-spiked soils. Subsequently, bioluminescence was significantly reduced with increasing level of Cd spike. Luminescence sharply declined in all the Cd-spiked soils when the exposure time increased from 30 to 40 min. At the end of the experiment, inhibition of

luminescence due to Cd spiking has been reduced compared to that at day 20 sampling.

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