

Assessing the Bioavailability of Ni in Smelter Contaminated Soils. (S11-everhart242852-oral)

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Abstract:

Metal contaminants in soil environments derived from industrial pollution have clearly established the need for research on bioavailability and potential health risks. Much research has been conducted on metal sorption in soils. However, there is still a need to better understand the availability of metal contaminants to plants and microbes. Such information will enhance both human health and decisions about remediation efforts. In this study, Welland Loam and Quarry Muck soils contaminated with Ni from a smelter facility that had been treated and untreated with lime, were employed in greenhouse and bioavailability studies. *Avena sativa*, a nonhyperaccumulator, and *Alyssum murale*, a hyperaccumulator plant species, were grown in the greenhouse to determine Ni accumulation. Plant and soil analyses from the greenhouse experiment were combined with Ni bacterial biosensor data. Results of the study suggest that as the pH of the soil was increased with liming, Ni bioavailability decreased. However, the phytoextraction capability of *Alyssum murale* increased when bioavailability decreased which was not the case for *Avena sativa*. The Ni bacterial biosensor was successful in predicting Ni bioavailability in the soils and suggested that the higher plant-available Ni occurred in the soils at pH values of 5.1 and 6.

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