

Localization of Competing Metals (Ni, Co, and Zn) in *Alyssum* using micro-XRF and Tomography. (3564)

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Abstract:

Unique metal-accumulating plants (i.e. hyperaccumulators) have the ability to mobilize, absorb, translocate, and compartmentalize excess quantities of heavy metals. These rare plants can be used to extract metals from contaminated sites (i.e. phytoextraction) or to mine metal-rich soils (i.e. phytomining). *Alyssum murale* is a Ni hyperaccumulator. Industrial sites contaminated with Ni would likely have co-contaminants present that compete with Ni and alter the extraction efficiency of *A. murale*. We investigated the effect of competing metals (e.g. Co and Zn) on Ni accumulation and observed metal localization in root and shoot tissue using synchrotron based micro-XRF and tomography. Plants were propagated from cuttings (vegetative) excised from a mature 'mother plant' to assure minimal variation within treatment populations. Plants were grown in perlite media and exposed to nutrient solution via an ebb and flow method. The modified 1/4-strength Hoagland's solution contained elevated levels of Ni, Co, or Zn (50 uM Ni, 50 uM Ni with 50 uM Co or Zn, and 50 uM Ni with 50 uM Co plus 50 uM Zn), and was buffered at pH 6.2 with 2 mM MES. After six weeks exposure, plants were harvested (root and shoot), weighed, dried, digested (EPA 3050 B), and analyzed for total metal content by ICP. The plant biomass and metal concentration data was used to evaluate total metal extraction.

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Session Information: Monday, November 1, 2004, 10:00 AM-12:00 PM

Presentation Start: 10:00 AM (Poster Board Number: 1566)

Keywords: Nickel; *Alyssum murale*; Tomography; Phytoremediation