Fractionation of arsenic in soil contaminated with various heavy metals. (S11-fayiga122934-Poster)

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Abstract:

This study determined the effect of heavy metals and plant uptake on redistribution of arsenic in soil contaminated with chromated copper arsenate (CCA).The CCA soil was spiked with Pb, Cd, Ni, Zn solutions at two levels, 50 and 200 mg/kg. Chinese brake fern was transferred into pots after one week and grown in the greenhouse for 8 weeks. Soil samples taken after 8 weeks were sequentially extracted with NH4Cl (water-soluble plus exchangeable, WE-As), NH4F (Al-As), NaOH (Fe-As), and H2SO4 (Ca-As). Arsenic in the soil was present primarily as the recalcitrant forms with WE-As less than 10%.There was also significant correlation between total plant biomass and Ca-As in the soil, which was the largest fraction (51.4%) of arsenic removed from the soil by plant. Though 2.9% of arsenic removed from the soil was from the WE-As fraction, it increased from 5 to 8 weeks after plant uptake, indicating the capability of the fern to solubilize soil arsenic.Ca-As was the dominating fraction before fern transfer, whereas Al and Fe-As became the dominating fraction in the soil 8 weeks after planting.This study suggests the importance of calcium to Chinese brake fern growth and arsenic uptake.

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