Phytoremediation using microbially mediated metal accumulation in *Sorghum bicolor*

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Abstract

Reclaiming land that has been anthropogenically contaminated with multiple heavy metal elements, e.g., during mining operations, is a growing challenge worldwide. The use of phytoremediation has been discussed with varying success. Here, we show that a careful examination of options of microbial determination of plant performance is a key element in providing a multielement remediation option for such landscapes. We used both (a) mycorrhiza with *Rhizophagus irregularis* and (b) bacterial amendments with *Streptomyces acidiscabies* E13 and *Streptomyces tendae* F4 to mediate plant-promoting and metal-accumulating properties to *Sorghum bicolor*. In pot experiments, the effects on plant growth and metal uptake were scored, and in a field trial at a former uranium leaching heap site near Ronneburg, Germany, we could show the efficacy under field conditions. Different metals could be extracted at the same time, with varying microbial inoculation and soil amendment scenarios possible when a certain metal is the focus of interest. Especially, manganese was extracted at very high levels which might be useful even for phytomining approaches.

Beteiligte Forschungseinheiten

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