Phytoremediation and Harvester Ants: A Method for Identification of Plant Species Suitable for Heavy Metal Remediation

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A novel method is proposed to assist biologists in selecting the most suitable plant species for phytoremediation of site-specific heavy metal contamination. Only a few plants with the capacity of accumulating heavy metals have been discovered, and they often are non-native to the site and unsuitable for the local soil and climate. This method involves Harvester ants, which play a crucial role by gathering seeds from a wide area and storing them within their nests for future consumption. Samples are collected from ant nests, seeds are extracted, sorted, and measured for heavy metal content using the ICP analytical method. The plant species are then determined through seed morphology analysis. This method capitalizes on a dual bioaccumulation process occurring first in plants and again as ants concentrate seeds within their nests. These procedures were tested at a lead-contaminated site, and several non-invasive bioaccumulating plants were identified. This method is useful for biologists to identify phytoremediation candidates at a contaminated site.