

Assessment of heavy metal uptake and translocation in *Acacia mangium* for phytoremediation of cadmium-contaminated soil.

ABSTRACT

Soil and water pollution have become a major environmental problem, attracting considerable public attention over the last few decades. Many organic and inorganic pollutants, including heavy metals, are being transported and mixed with the cultivated soils and water. Heavy metals are dangerous environmental pollutants that can be transferred and accumulated in human and animal bodies causing DNA damage and carcinogenic effects. These soil contaminants need to be cleaned up for safety environment. Experiment was conducted to evaluate the potential of *Acacia mangium* as a phytoremediator to absorb heavy metals from contaminated soils. *A. mangium* seedlings were planted on six different growth media (soil + different levels of cadmium) were: T0 (Control, soil), T1 (25 ppm Cd), T2 (50 ppm Cd), T3 (75 ppm Cd), T4 (100 ppm Cd) and T5 (150 ppm Cd). The highest growth performance such as basal diameter, height and number of leaves was found in T3, T2 and T4 treatments, respectively. The highest accumulation of Cd (28.29 ppm) was recorded in T5, Cu in T2 (23.69 ppm) and Zn (241.96 ppm) in T4. Cu was highly concentrated in the roots, Cd was accumulated in the stems, whereas Zn was both in stems and leaves. *A. mangium* showed high translocation factor (TF) and low bioconcentration factor (BCF) values in soil at higher metal concentrations as well as it was able to tolerate and accumulate high concentrations of Cd, Cu and Zn. The roots of *A. mangium* were found to be suitable for the absorption of heavy metals in contaminated soils, especially Cu. Cd was accumulated in the stems while Zn in both stems and leaves. This species can be a good efficient phytoremediator for soils contaminated with Cd, Cu and Zn to mitigate soil pollution.

Keyword: *Acacia mangium*; Bioaccumulation capacity; Heavy metals; Phytoremediation.