

Kanoksak Udomsin 2011: Potential of Siam Weed (*Chromolaena odorata*) to Remediate Lead Contaminated Soil and Determination of Lead in Plant Components by Steam Explosion and Wayman's Method. Master of Science (Environmental Science), Major Field: Environmental Science, College of Environment. Thesis Advisor: Assistant Professor Savaporn Supaphol, Ph.D. 170 pages.

Lead (Pb) is the most common heavy metal soil contaminant in the environment, especially from the Pb mine industry is the point source to Pb contaminated soils. At the present, current technologies attempt to remediate by physical or chemical separation of soils contaminants. However, these techniques are labor intensive and costly. Thus, using of plants to remediate Pb or heavy metals in soil contaminants especially known as phytoremediation. Phytoremediation, the use of green plants to clean up metal contaminated environments has attracted attention as an environmentally friendly and useful metal-extraction technique for treating toxic contaminated soil. However, the management of hyperaccumulated plants after phytoremediation is very important issue. For more, very few studies to lead hyperaccumulator and utilize a hyperaccumulating plants after phytoremediation.

In this thesis studies to the potential of Siam weed (*Chromolaena odorata*) to remediate Pb contaminated soil in remediation times at 15, 30, 45, 60, 75 and 90 days from green house experiments and determination of Pb in plant components was established using steam explosion, Wayman's extraction method, and an atomic absorption spectrophotometer (AAS). The experiment design was on 2x6 in completely randomized design (CRD) with three replicates. In the result, the appropriate to harvesting time at 45 days and the concentration of total Pb in soils after remediation had decreased from 75,529.38 mg kg⁻¹ to 68,446.46 mg kg⁻¹. This illustrates the potential of Siam weed to remediate soil as around 9.38% of total Pb was decreased in the first crop. The determination of Pb in plant components from steam-exploded Siam weed was selected to steaming pressure and steaming time in steam explosion and the Wayman's method at 19 kg cm⁻² in 5 min, and the Pb was accumulated in cellulose fraction > Klason lignin fraction > water-soluble material fraction > methanol-soluble lignin fraction, significantly (p≤0.05) at 75.5, 17.2, 5.0 and 2.3% in aboveground parts and 84.1, 11.0, 3.3 and 1.6% in underground parts, respectively.

Student's signature

Thesis Advisor's signature