

636/E2

**Phytoextraction of heavy metals in semi-aquatic environments using selected  
*colocasia* sp. and *wedelia* sp.**

M D C S Perera and R C L De Silva\*,  
Department of Chemistry University of Kelaniya, Kelaniya

This particular study focuses on remediation of heavy metal ( $\text{Cd}^{2+}$  and  $\text{Pb}^{2+}$ ) contaminated semi-aquatic environments using two plant species, a *Colocasia* sp. and a *Wedelia* sp. which are two common local plants growing under semiaquatic conditions.

The main research work involved two experimental setups; the pot experimental setup and the hydroponic solution experimental setup (only for *Colocasia* sp.).

In pot experimental setup a series of plants were allowed to grow for a certain period of time in pots containing varying concentrations of the analyte in soil. Then the plant materials (aerial parts and below ground parts separately) and the corresponding soil samples were digested and analyzed using flame atomic absorption spectrometer (FAAS).

In hydroponic solution experimental setup, plants of similar nature were placed in conical flasks containing varying concentrations of the analyte in a hydroponic solution and observed for two weeks. Then the plant materials and the solutions were digested and analyzed using FAAS.

The two experimental plants *Wedelia* sp. and *Colocasia* sp. have not proven to be suitable candidates for  $\text{Cd}^{2+}$  phytoextraction. The maximum tolerable  $\text{Cd}^{2+}$  concentration for *Wedelia* sp. was 450 mg per 1kg of dry soil while that for  $\text{Pb}^{2+}$  was 1500 mg  $\text{kg}^{-1}$  (after 60 days in soil). This shows that the toxicity of  $\text{Cd}^{2+}$  on the *Wedelia* sp. is higher than the  $\text{Pb}^{2+}$  toxicity on the same plant. At 450 mg  $\text{kg}^{-1}$  concentration in soil, phytoextracted concentration of  $\text{Cd}^{2+}$  was 8.1( $\pm$ 0.4) mg  $\text{kg}^{-1}$  while that for  $\text{Pb}^{2+}$  was 128.9( $\pm$ 4.6) mg  $\text{kg}^{-1}$ . The maximum  $\text{Cd}^{2+}$  concentration which was tolerated by the *Colocasia* sp. was less than 10ppm and survived less than a week in hydroponic solution.

\*russel@kln.ac.lk

Tel: 011 - 2903271