

Isolation of Mercury-binding Peptides in Vegetative Parts of *Chromolaena odorata*

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Mercury-binding peptides from roots, stems, and leaves of Hg-treated *Chromolaena odorata* plants were isolated and partially characterized using RP-HPLC and ESI-MS. Upon exposure of *C. odorata* plants to high concentrations of 1.0 and 2.0 μM $\text{Hg}(\text{NO}_3)_2$ treatments from 0–28 days, they accumulated as much as 125 mg/g (dry wt) Hg in the roots, 15.280 mg/g (dry wt) Hg in the stems, and 0.800 mg/g (dry wt) Hg in the leaves indicating that *C. odorata* has a high potential as a phytoremediation agent of inorganic mercury. The plant's ability to accumulate and sequester Hg ions was primarily attributed to the production of Hg-binding peptides, which were initially detected through the use of Ellman's reagent. Isolation techniques using RP-HPLC equipped with a C18 column manifested a single prominent peak consistently appearing at a retention time of 2.6–2.8 min in all the plant samples treated with different Hg concentrations at varying lengths of exposure. Further characterization of this prominent peak using electrospray ionization mass spectrometry revealed the presence of a peptide containing several cysteine residues with the highest peak concentration recorded at 91 mV and 89 mV in roots and stems of plants treated with 2.0 μM $\text{Hg}(\text{NO}_3)_2$ for 4 wk ($P < 0.05$) and 85 mV in leaves treated with 1.0 μM $\text{Hg}(\text{NO}_3)_2$ for 1 wk.

Key words: *Chromolaena odorata*, Phytoremediation, Phytochelatin