

Enhanced Uptake Of As, Zn and Cu By *Vetiveria Zizanioides* and *Zea Mays* Using Chelating Agents

K. K. Chiu¹, Z. H. Ye^{1,2}, and M. H. Wong¹

¹*Institute for Natural Resources and Environmental Management, and Department of Biology, Hong Kong Baptist University, Kowloon, Hong Kong, China*

²*School of Life Sciences, Zhongshan University, Guangzhou 510275, China*

Extended Abstract

Vetiveria zizanioides (vetiver) is ideal grass for the phytoremediation in metal-contaminated soils. A greenhouse study was conducted to investigate the feasibility of using vetiver and *Zea mays* (maize) for remediation of arsenic (As)-, zinc (Zn-) and copper (Cu)-amended soils and evaluate the effects of chelating agents on metal uptake in these plants. In this research, we investigated the effects of various chelates on As, Zn and Cu desorption from soil to soil solution, studied the physiological characteristics of As, Zn and Cu hyperaccumulation is to increase soil As, Zn and Cu availability. We have found that 20 mmol NTA could maximize As and Zn bioavailability, while 20 mmol HEIDA could maximize Cu bioavailability among 9 chelating agents used. Moreover, vetiver had a better growth (dry weight yield production of root and shoot) than maize that suggested that vetiver is a better choice for remediation of metal-contaminated areas. The present results also revealed that the surge time in maximizing metal uptake were 16-20 days and indicated that timing on plant harvest was important factor in enhanced metal accumulation. During that time harvest, the metal uptake in plants was maximized. However, the application on As, Zn and Cu accumulation with adding of chelating agents in As-, Zn- and Cu-amended soils only increased 3-fold As and Cu in shoot of vetiver and maize, but various in Zn. Based on the results, it was not feasible to clean-up these metals (As, Zn and Cu) by using chelate enhanced phytoextraction.

Email contact: M. H. Wong <mhwong@hkbu.edu.hk>