

Metal Removal Efficiency of Water-soluble Lectin from *Moringa oleifera* Seeds

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INTRODUCTION: Contamination with metals is a major environment-related health concern. *Moringa oleifera* seeds have demonstrated coagulant property and have been effectively used to treat water for human consumption. The water-soluble *M. oleifera* seed lectin (WSMoL) is a chitin-binding protein of anionic nature and has demonstrated coagulant activity in a turbid water model. **OBJECTIVE:** This study evaluated the effectiveness of WSMoL in removing metals from aqueous solutions and whether metals interfere with the carbohydrate-binding property (hemagglutinating activity) of WSMoL. **MATERIALS AND METHODS:** Aqueous solutions (pH 6.0) containing 20 µg/mL Mn²⁺, Mg²⁺, Cu²⁺, Pb²⁺, Zn²⁺, Al³⁺, or Cd²⁺ were prepared with deionized water. WSMoL (0.2 mg/mL) was added (2%, v/v) to flasks containing 5 mL of a metal solution and the assays were incubated for 8 h at 4°C. Thereafter, the supernatant was separated by centrifugation (15,000 g for 5 min) and the concentration of metals ions was determined using atomic absorption spectrometer. The metal removal efficiency (%) were calculated. The supernatants were also evaluated for hemagglutinating activity using rabbit erythrocytes; a control assay was performed replacing the metal solution by deionized water. Each assay was performed in triplicate. **RESULTS AND DISCUSSION:** The removal efficiency of WSMoL was 49.00%, 53.21%, 71.45%, 55.42%, 69.88%, 62.14%, and 49.36% for Cd²⁺, Pb²⁺, Cu²⁺, Zn²⁺, Mg²⁺, Mn²⁺, and Al³⁺, respectively. The specific hemagglutinating activity of WSMoL (1,020 in control) decreased to 317, 102, 5.0, 102, 102, 22, 178 after exposure to Cd²⁺, Pb²⁺, Cu²⁺, Zn²⁺, Mg²⁺, Mn²⁺, and Al³⁺, respectively. **CONCLUSION:** WSMoL efficiently removed metals present in water but there was an impairment of its carbohydrate-binding property when associated to the metals and antibacterial activity. This should be considered when properties of WSMoL other than metal removal are desired.

Keywords: coagulant protein; *Moringa oleifera*; metal removal; hemagglutinating activity.

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