

**Bioavailabilities of Mn and Cd in the in-vitro human gastrointestinal tract from the consumption of contaminated wild water spinach and health risk assessment**

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**Abstract**

Edible aquatic plants from heavily metals-polluted ponds may put human health at risk if they were consumed. Therefore, assessment studies on the bioavailabilities of Mn and Cd in contaminated water spinach (*Ipomoea aquatica*) by in-vitro gastrointestinal extractions and their health risks are presented in this paper. Mature plants grown in contaminated hydroponic solution under greenhouse conditions were harvested. Digestions in human stomach and small intestine were simulated and carried out on the edible plant shoots (stems and leaves). The precision and accuracy were assessed by standard reference material (peach leaves, SRM 1547). Atomic absorption spectroscopy (AAS) was employed to determine metal concentrations in the plant samples. The results indicated that plant forms greatly differed in their metal bioavailabilities, e.g. cooked samples (CHS) and dried samples (DHS) had higher bioavailabilities of Mn and Cd than raw (RHS) and in gastric and intestinal extractions, respectively. Moreover, it was also found that metal bioavailabilities varied between the gastric and intestinal extractions, e.g. total Mn and Cd bioavailabilities were found to be highest in the intestinal and gastric extractions, respectively. Health risks exist among adults in Selangor, Malaysia if they consumed Cd-T2-contaminated cooked plants which as shown by the hazard quotient (HQ) and health risk index (HRI).

Keywords: Water spinach, bioavailability, Mn, Cd, gastrointestinal, health risks.

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