

Phytoremediation has potential to be implemented at mercury (Hg) and methylmercury (MeHg) contaminated sites. Water hyacinths (*Eichhornia crassipes*) were investigated for their ability to assimilate Hg and MeHg into plant biomass, in both aquatic and sediment-associated forms, over a 68-day hydroponic study. The suitability of *E. crassipes* to assimilate both Hg and MeHg was evaluated under differing PO_4 concentrations (0.0 mg- PO_4 , 2.5 mg- PO_4 , 12.5 mg- PO_4 , and 22.5 mg- PO_4), light intensities (94 Lux and 976 Lux), and sediment : aqueous phase contamination ratios. MeHg levels in water, sediment, and *E. crassipes* roots and shoots were also measured.

Mercury and MeHg were found to concentrate preferentially in the roots of *E. crassipes* with little translocation to the shoots or leaves of the plant. Sediments were found to be the major sink for Hg as they were able to sequester Hg, making it non-bioavailable for water hyacinth uptake (plant tissue concentrations of ~10,000 mg-Hg/kg and ~1,000 mg-MeHg/kg in the absence of sediments and ~2,000 mg-Hg/kg and < 200 mg-MeHg/kg in the presence of sediments). We observed an optimum PO_4 concentration (2.5 mg- PO_4 /L) at which Hg and MeHg uptake is enhanced (~3X greater Hg and MeHg uptake compared to 0.0 mg- PO_4 /L, 12.5 mg- PO_4 /L or 22.5 mg- PO_4 /L conditions). Increasing light intensity served to enhance the translocation of both Hg and MeHg. Assimilation of Hg and MeHg into the biomass of water hyacinths represents a potential means for remediation of contaminated waters and sediments under the appropriate conditions.