

Thesis Title Uses of Several Species of Floating Aquatic Plants as Biomonitors in
Assessing Heavy Metal Accumulation from Aquatic Ecosystems in
Chiang Mai

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M.S. Environmental Risk Assessment for Tropical Ecosystems

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ABSTRACT

The study was conducted by collecting water, sediment, and plant samples from the Mae Ping River and Mae Kha Canal at the ends of the rainy and dry seasons in 1994. The Cd, Cu, Pb, and Zn contents in the samples were analysed by atomic absorption spectrophotometry.

Various sample pretreatment procedures were employed prior to the analysis by atomic absorption spectrophotometry depending on the samples concerned. Metal ions in the water samples were complexed with the mixture of pyrrolidinecarbodithioic acid

ammonium salt (APDC) and diethylammonium N,N-diethyldithiocarbamate (DDDC), and the complexes were then extracted with isobutyl-methylketone (MIBK) and the metal ions were back extracted into the aqueous solution. Plant samples were digested with HNO₃:H₂O₂ (1:2/v/v) oxidant solution and the sediment samples were digested by HNO₃:HCl (1:3/v/v) solution.

The results showed that Cd, Cu, Pb, and Zn contents in the Mae Kha Canal were much higher than those in the Mae Ping River even though the distribution of such metals was not uniform. The sediment contents of the four elements are also higher than the average abundance of them in the granite rock which is a geological characteristic of the Chiang Mai Basin. There is also a great accumulation of the four elements in both *Eichhornia crassipes* and *Ipomoea aquatica*, with a higher ratio in the former than in the latter. Metal contents in the water in both the Mae Kha and Mae Ping were lower than the Thai national standard levels for a second class surface water indicating that the water is still acceptable in terms of the Cd, Cu, Pb and Zn pollution. However, the water in both the Mae Ping River and Mae Kha Canal can not be recommended as drinking water unless appropriate water treatment is applied.

