E2 32

Aquatic plants as indicators of heavy metal pollution

In order to evaluate the metal pollution in aquatic systems following waterways were selected for the investigation: Boralesgamuwa, Diyawanna Oya, Attidiya Marshy Land, Kesbewa Wewa Wewita Wewa and Gammanpila Wewa.

The plants chosen for the studies were *Eichornia, Hydrilla, Nymphea, Pistiya*, *Salvinia* and *Utricularia*. Plants (60 samples of each plant) water (80 samples) and sediment (80 samples) were analysed using Differential Pulse Anodic Stripping Voltametry (DPASV) and Flame Atomic Absorption Spectroscopy (AAS) for the metal content of Cr Pb and Cd.

Results show that for all the plants analysed the order of metal accumulation was found to be the same: total Cr (124 mg/kg)> total Pb (14.9 mg/kg)> total Cd (5.36 mg/Kg) (results are given on mean dry weight basis). *Salvinia*, *Eichonia* and *Hydrilla* show capacity for relatively higher metal absorption and *Nymphea* show lower capacity for relatively higher metal absorption by plans depend on the type of metal of plant and the concentration of metal in water or sediments.

The results show that there is a good correlation between the concentration of metal in the sediments with the concentration of metal in water for unpolluted waterways (for Gammanpilla Wewa r=0.94 and Wawita Wawa `r=0.83).

For polluted waterways low correlation was observed (Boralasgamuwa R = 0.72 Diyawanna Oya r = 0.62, Kesbewa r = 0.73, Attidiya r = 0.54). Low correlation coefficient may be a good indicator of polluted waterways. This may be due to the high rate inflow of the water-body and the time taken in achieving the steady state concentration of metal absorption by the terrestrial environment.

Pb and Cd accumulation in *Erichornia*, *Pistia*, *Hydrilla and Salvinia* show a good correlation (R> 0.70) with Pb, and Cd concentration in water. Except for salvinia, Cr accumulation in water plants show poor correlation (r <0.60) with Cr in water. Accumulation of all the three metals Cr, Pb, Cd in the rooted plant Nymphea shows a good correlation (r>0.77) with the concentration of those metals in the sediments. It is clear by analyzing the heavy metals in the aquatic plants, extent of pollution in the waterways can be estimated.