

D-01 A plant study to monitor air pollution

R Hewamanna¹, D R Abeydeera²

¹ Radioisotope Centre, University of Colombo, ² Dept of Physics, Open University, Nawala

Bio-monitoring is an experimental method to measure the response of organisms to air pollution. Bio-monitors have several advantages compared to the use of air filters and deposition collectors related primarily to the permanent and common occurrence in the field, the ease of sampling, the degree of trace element concentration, and as a measure of integrated exposure over a certain amount of time.

Bio-accumulation of some heavy metals in 5 different plant species collected from Colombo during January-November 1995 was studied to identify a suitable plant which could be used as a transplant or a monitor for heavy metals. The selected plants were *Peltrophorum marsupium*, *Pleopeltis* species, *Calymperes* species and 2 types of lichens. Samples were analysed by Energy Dispersive X-ray Fluorescent technique using a Rh anode X-ray tube. Spectra obtained were analysed using the AXIL program.

Differential accumulation of elements was measured in the plants studied. The highest accumulation of Pb, Br, As, S, Fe and Ti was detected in the moss *Calymperes* with mean elemental concentrations of 107, 26, 57, 4800, 2720 and 260 $\mu\text{g/g}$ dry plant, respectively. The concentration of Pb levels in air filters measured for 8 h during the same period at one sampling site ranged from 0.12-1.39 $\mu\text{g/m}^3$. The main source of Pb, Br and S can be associated with the auto-exhausts while Fe and Ti are due to soil dust suspended in the air. Hence *Calymperes* can be used as a bio-monitor to obtain qualitative information on atmospheric levels of auto-exhausts and suspended soil dust in different locations in Sri Lanka.