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**POSSIBLE EFFECTS OF SOME TOXIC ELEMENTS OF SOIL AND
PLANTS IN FOREST DIEBACK AREAS OF HAKGALA STRICT
NATURAL RESERVE**

A PROJECT REPORT PRESENTED BY

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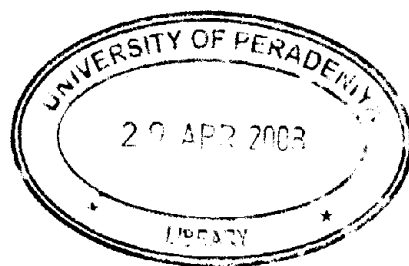
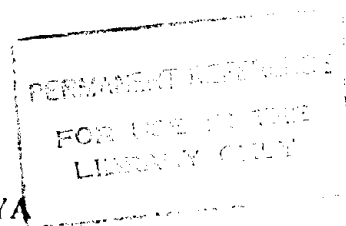
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A number of hypotheses have been suggested for the cause of the forest dieback in the Central highlands in Sri Lanka which include long-term factors such as wind factor, tree species, tree age, and air and soil pollution. Short-term factors included adverse weather and insect infestations. The implication of air pollutants (ozone, acidic materials, hydrogen peroxide, etc.) as contributing factors to the decline of forest is not substantial at present in Sri Lanka. Although the montane forests are impacted by various air pollutants, evidence is lacking concerning the detrimental effects of these phytotoxic substances and growth.

Element content of Pb, Al, Fe and Mn in the soil samples and plant samples of selected species were measured in HSNR. The content of these elements are relatively higher in ashed leaf samples than soil samples. No significant correlations were observed between the heavy metal concentrations in surface soils and plants leaves where dieback is observed except Pb. Accumulation may cause high level of elements in the montane plant species relative to concentration in soil samples. However the recorded available concentration of Fe, Mn, Al and Pb can be toxic to certain montane plant species. The recorded available concentration of Pb and Al are exceptionally high in soil of HSNR. High level of Pb and Al can be toxic to all selected plant species, *Calophyphyllum walkeri*, *Cinnamomum ovalifolium*, *Eugenia mabaeoides*, *Meliosma simplicifolia*, *Syzygium revolutum*, *Syzygium rotundifolium*, *Symplocos bractealis*, *Nothapodytes foetida*.



On a local scale, exposure to high concentrations of Pb and Al, result in foliar injury, branch dieback, reduced radial growth and increased mortality in a variety of tree species. On a regional scale, the transboundary effect is responsible for growth decline of pollutant-sensitive many trees in montane forests in Sri Lanka. Lead pollution in the air has been suggested as the most likely cause since the affected region reports high Pb content in soils, which may transported to the region with the transboundary effect.