

## PHOSPHATE UPTAKE BY FLORA ON *EPPAWALA* ROCK PHOSPHATE DEPOSIT

K.W.D.L. Jayathilake<sup>1</sup>, W.C.P. Egodawatta<sup>1</sup> and M.C M. Iqbal<sup>2</sup>

<sup>1</sup>*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

<sup>2</sup>*Plant and Environmental Sciences, National Institute of Fundamental Studies, Hantana Road, Kandy, Sri Lanka.*

Application phosphate fertilizers excessively result phosphorus (P) enriched soils; thus, it has become a pollutant for many global ecosystems. Phytoremediation or plant mediated P mining is an ecological remedy which is well achieved using candidate plants growing on naturally phosphorus enriched habitats. *Eppawala* rock phosphate (ERP) deposit has inherently high content of phosphorus (28% to 42% P<sub>2</sub>O<sub>5</sub>) and is a habitat to a diverse flora. This study hypothesized that the plants species grow naturally on ERP deposit have acclimatized to uptake substantially high phosphorus. Eleven candidate plant species compared for total plant leaf P content from ERP deposited and from *Kandy*; a non-phosphorus enriched habitat. Total and available P was measured for soils collected from these two locations. Mean total leaf P content of plant species on ERP deposit ranged between 8.45 – 24.86 mgg<sup>-1</sup>, while in *Kandy* it ranged between 0.63 – 5.14 mgg<sup>-1</sup>. Soil available P content in ERP deposit ranged between 0.176 – 0.353 mgg<sup>-1</sup>; in *Kandy*, it was minimum and ranged between 0.028 – 0.072 mgg<sup>-1</sup>. The correlation between plant P content and soil available P content was 0.43 ( $p=0.039$ ) in *Eppawala* and 0.30 ( $p=0.161$ ) in *Kandy*. The rate of uptake of P by flora was similar ( $p=0.07$ ) in both locations, despite higher rate uptake in *Eppawala*. Three candidate flora species were compared for phosphorus up taking ability with a greenhouse pot experiment, by providing soils from ERP deposit using planting materials collected from both locations. Mean plant P uptake *Trianthema portulacastum* (*Sarana*), *Mimosa pudica* (*Nidikumba*), *Tridax procumbens* (*Kurunegala desi*) were not significantly different ( $p>0.05$ ) for two locations, despite quantitatively high P in flora from *Kandy*. The selected flora did not have special adaptations to uptake P from P enriched soils, hence these candidate species from any habitat are useful for phytoremediation process.

**Keywords:** Available phosphorus, *Eppawala* rock phosphate deposit, Phytoremediation