ECOLOGY OF THE SERPENTINE VEGETATION AT USSANGODA, SRI LANKA

Y. A. S. Samithri

Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka.
National Institute of Fundamental Studies, Hanthana Road, Kandy, Sri Lanka,

Serpentine deposits are unique habitats which frequently support distinct vegetation. Present study aimed to reveal the diversity and spatial patterns of serpentine vegetation of Ussanagoda and to detect some soil physico-chemical parameters (soil pH, moisture, total organic carbon and Ca, Mg, Ni and Fe contents) in the site and to detect the metal content in plants at the serpentinite. Herbaceous vegetation was enumerated in a twenty one 25 × 25 m^2 experimental plots established at randomly chosen points. Frequency of occurrence of all plant species in 'forest islands' was recorded and analyzed to reveal the diversity of vegetation in relation to the size of the 'forest island'. Soil chemical parameters were determined in samples collected at randomly laid three 1 m^2 quadrates in fourteen 25 × 25 m^2 experimental plots. Plant parts collected from the 'serpentine plains' and from 'forest islands', were analyzed to reveal the metal accumulation in plant species at serpentine soil.

Sixty seven plant species belonging to 61 plant genera and 30 plant families were identified from this study area. Of these, 18 were herbaceous species belonging to seventeen genera and eleven families. A higher diversity of plant species was recorded in 'forest islands' which include 49 tree, shrub, herb and climber species belonging to 44 genera and 27 families. Only two endemic species have been found from the study area at Ussangoda though it provides a habitat for four nearly threatened and two vulnerable species identified at national level. 'Forest islands' are of different sizes but, the species richness was more or less the same in all 'forest islands' irrespective of their size. However, no endemic or threatened species were found in smaller 'forest islands' indicating the necessity of protecting remaining large 'forest islands' because, if the forest island size decreases, these will not support the endemic and threatened species.

Ordination analyses revealed that the species composition and abundance over the serpentine plains do not vary over the area in relation to the examined soil parameters. However, the composition of some herbaceous species showed a significant correlation with some soil parameters. Some serpentine plants appear as eco-physiologically well adapted to its metal rich substratum. Thus, six Ni hyper accumulator species (*Hybanthus enneaspermus*, *Euphorbia thymefolia*, *Evolvulus alsinoides*, *Vernonia cineria, Olax imbricata and Flacourtia indica*) and accumulator species of some other elements as Fe, Cr, Pb, Na, Cr, Co and Mg at Ussangoda serpentine deposit were identified. These species could be used in phytoremediation, a green technology to clean up toxic metals in the soil. Further, this study clearly identified the characteristic features and ecological significance of Ussangoda serpentine site and therefore, provides essential information for the conservation and management of this distinctive ecosystem.