

## Executive Summary of the Project

Serpentine soils are derived from serpentine rocks composed of serpentine minerals and ultramafic rocks, with a high content of ferromagnesian minerals. Their weathering enriches the soil with Mg, Fe and other heavy metals which alter the physical and chemical properties of the soil creating an unfavourable environment for plant growth. Sri Lanka has six serpentinite sites. The Ussangoda site is on the southern coast in Hambantota. The objective of this project is to understand the serpentinite nature of the soil and plant adaptations.

Soil samples were collected to a depth of 10 cm to determine the soil physical and chemical properties. Plant samples were collected, for identification. Soil and plant samples were analysed for heavy metals and nutrients using an Atomic absorption spectrophotometer.

The soil was silt loam with small amounts of sand and clay. The levels of Ca, Mg, Ni and Fe were high. The mean Ca/ Mg ratio was 1.1 on the plains and ranged from 1.5 to 2.0 for the patches of shrubs. The moisture content, organic matter, NPK and CEC were low and the C/N ratio was high in the serpentine soil. All these contributed to unfavourable conditions for plant growth.

Thirty one plant families were identified of which seven families with 10 species occur on the serpentine plain. These were prostrate, dwarf or stunted, with small leaves, thick sclerenchymatous stems and extensive root systems. The other species are shrubs and trees occurring in isolated small patches. The prostrate species *Euphorbia*, *Evolvulus*, and *Vernonia cinerea* were hyper-accumulators of Ni. Few of the shrub species accumulated Ni but tolerated high Mg content in their tissues.

The soil shows typical characteristics of serpentinite soil elsewhere. Plant species have adapted and evolved on this soil to give a unique assemblage of plants with unusual morphological and physiological adaptations. This unique ecological habitat should be conserved to preserve its biodiversity and to study plant adaptation and the preserve the geological significance of this site.