Potassium dynamics of a forest soil developed on a weathered schist regolith

ABSTRACT

Soils of the humid tropics are poor in available potassium due to intensive weathering and leaching of nutrients. A study was conducted to investigate the mineralogy and potassium supplying capacity of a forest soil developed on a weathered schist regolith. The quantity–intensity (Q/I) approach was used in thisstudy. The schist regolith showed deep weathering and intense leaching throughout the profile, resulting in low cation exchange capacity (CEC) and available K in soil and saprolite layers. The mineralogy of the regolith was dominanted by kaolinite, gibbsite and goethite. Feldspar, mica and mica–smectite minerals were observed in the lower saprolite layers. The Q/I parameters showed that the soils and saprolites were low in K supply power. This observation was attributed to weathering and intense leaching. The free energy values of K replacement ($\Delta G\ r°$) also suggest that soils and saprolites of the schist regolith were deficient in K. The Q/I parameters significantly correlated with organic carbon and clay content, CEC, pH and exchangeable K.

Keyword: Potassium; Quality-intensity relationship; Weathered forest soil; Schist; Regolith