

ABSTRACT

This study has examined the concentrations and distribution of 28 elements in the Negril peat morass. Three analytical techniques, namely, Instrumental Neutron Activation Analysis (INAA), X-ray Fluorescence Spectroscopy (XRF) and Ultraviolet-Visible Spectrophotometry were used to determine the elements in the 32 peat samples collected. Al, As, Br, Ca, Ce, Cl, Co, Cr, Cs, Dy, Eu, Fe, Hf, I, La, Lu, Mg, Mn, Na, Sb, Sc, Sm, Sr, Th, Ti, U and V were determined by INAA, with low limits of detection achieved for most of the elements. Boron was determined by UV-Visible Spectrophotometry. Semiquantitative results for Cu, Fe and Ni determined by XRF are discussed.

The variation in concentrations with depth in the morass for most of the elements shows no clear pattern. However, five elements, namely As, Cl, Na, Sb and U exhibit increases in concentrations with depth at all sample sites investigated. Ca is the only element that shows a decrease in concentration with depth.

A progressive decrease in concentration from near the seashore towards inland was seen for Br, Cl, Dy, Mg and Na. There are significant correlations between the concentrations of B, Br, Cl, I and Na in the Negril morass and the respective concentrations in seawater. The results also show that the concentrations of Na and Cl in the morass is approximately equivalent to the respective concentrations in seawater. This could indicate that an incursion of seawater into the morass is the main source of these two elements.

For most of the elements identified in the morass, the levels in concentration are much lower than the crustal abundances. The rare earth elements, in particular, are severely depleted. Four elements, As, Br, Sb and U are enriched in the Negril morass. Despite the comparison with crustal abundances, the concentrations in the Negril morass are much higher than in other peat deposits for which data were available.