A B S T R A C T

Four lowland Trinidad soils (Histosols, Inceptisols, Vertisols Mollisols respectively) representing a wide range of organic matter contents were examined in the drained (aerobic) and submerged (anaerobic) phases. The major soil metals were characterised by selected chemical extractants ('total' : HCl; CH_3COONa, pH 4.8 and 8.2; CH_3COONH_4, pH 7.0; $NH_4O_2C_2O_2NH_4$, pH 3.0; EDTA, pH 7.0; $Na_4P_2O_7$, NaOH 20h and 1 week). Extractable metals and C varied considerably according to soil type and soil phase. Aluminium was predominantly associated with the organic extractable fraction and Fe with the reducible soil fraction. The macronutrients, K, Mg and Ca were associated with the exchangeable and weakly organic complexed fractions. The trace metals Zn and Mn were primarily associated with the hydrous Fe oxides and secondarily with the organic complexed fraction, whilst for Cu the preference for substrate was reversed. Metals added (Cu Fe Mn and Zn) to the Vertisols behaved in accordance with these results, but the effect of treatments varied with soil phase. Only Cu was strongly correlated to C.

The soil organic matter-metal complexes were extracted, and a technique for fractionating the 'stable' fulvic acid (FA) metal complexes was developed, and found sensitive to environmental conditions. 'Stable' humic acid (HA) and FA metal complexes were characterised by differential scanning calorimetry (DSC), infra-red spectroscopy (IR) and metal analysis. The DSC curves indicated considerable differences in thermal stability between drained and submerged FA complexes, as a function of metal load. Differences were less distinct in the less complexed HA fractions. The contribution of 'stable' complexed metals to the whole soil was low, but was considered an underestimation of the true value and thought likely to significantly contribute to soil fertility on prolonged waterlogging, of the soils.