

Metal-binding organic macromolecules in soil: 1. Hypothesis interpreting the role of soil organic matter in the translocation of metal ions from rocks to biological systems

Zunino, Hugo

Martin, James P.

The role of naturally-occurring soil organic matter (SOM) in the translocation of metal ions from parent materials to biological systems is discussed. To explain the movement of essential elements, a hypothesis or model is proposed wherein their translocation includes a sequence of reactions involving competition among electron donor simple molecules and highly polymerized organic materials with numerous functional groups. The sequence has a cascade character through which the metals are gradually transferred from the inert rocks to the higher animals. Naturally-occurring SOM binds the metal ions constituting an intermediate stage by which substantial losses by percolation of free cations, metallic aquo complexes, or simple organic metal complexes are avoided. Also SOM, highly saturated with metal ions, may constitute the most important pool of micronutrients available to biological systems. Microbial humic-acidlike polymers and polysaccharides with free functional groups likely constit