



Organic matter stabilization in mediterranean forest soils: interaction with fine mineral matter

P. Rovira (1), L. Lopez-Sangil (2), and V.R. Vallejo (2)

(1) Centre Tecnològic Forestal de Catalunya, Solsona, Spain (pere.rovira@ctfc.cat), (2) Dept de Biologia Vegetal, Facultat de Biologia, Universitat de Barcelona, Spain

The stabilization of organic carbon in soil depends both on its biochemical evolution (generation of recalcitrant byproducts along the decomposition of fresh organic inputs) and on its reaction with the mineral matrix, in a way that the decomposing organic matter becomes (partly, at least) unavailable to the soil microflora. The interaction with the mineral matrix may result from a number of mechanisms (light- to strong chemical bonds with clays, interaction with Fe and Al oxides, occlusion by carbonates) and the relative importance of each one for OC stabilization is poorly known. Here we present a study focused on a series of soil profiles, under *Pinus halepensis* stands and over calcareous substrates. Organic matter was fractionated following (i) size fractionation, after ultrasonic soil dispersion, and (ii) chemical fractionation with an ordered series of extractants, each one devoted to disrupt a specific bond type between the mineral matrix and soil organic matter: sodium tetraborate, sodium pyrophosphate, sodium hydroxide, sodium dithionite, hydrofluoric acid. This approach allows reaching a quite complete description of the status of soil organic matter relative to the several modes of stabilization in soil. The relative importance of each kind of chemical bond is assessed, and related to the specific type of geological substrate (limestones, marl, calcareous sandstones) and to the position within the soil profile (surface versus deep horizons).