



Glomalin related soil protein as indicator of fire severity: a laboratory approach

Elena Lozano (1), Katarina Chrenková (2,1), Victoria Arcenegui (1), Patricia Jiménez-Pinilla (1), Jorge Mataix-Solera (1), and Jorge Mataix-Beneyto (1)

(1) GEA (Grupo de Edafología Ambiental). Departamento de Agroquímica y Medio Ambiente, Universidad Miguel Hernández, Avenida de la Universidad s/n, 03202 Elche, Alicante, Spain, (2) Department of Soil Science, Faculty of Natural Sciences, Comenius University, Mlynská dolina B-2, 842 15 Bratislava, Slovak Republic

Glomalin Related Soil Protein (GRSP), a glycoprotein produced by arbuscular mycorrhizal fungi (Wright and Upadhyaya, 1996), was studied to determinate its effectiveness as an indicator of fire severity. Laboratory heating treatments were carried out at 180, 200, 250, 300, 400 and 500°C in soil samples from eight different sites of E Spain with different soil characteristics. Soil water repellency (SWR) and soil organic carbon (SOC) content were also studied to compare their sensitivity to temperature between certain parameters. Results showed that GRSP was affected even at low temperature, contrary to SOC, whose concentrations remained without changes at below 250°C. SWR did not appear in wettable soils after heating and disappeared in water repellent ones at temperatures over 200°C. GRSP behavior to temperature was different between soils. Redundancy Analyses divided sandy soils from the others. Silt, SOC, total content of aggregates (TCA) and initial GRSP concentrations were the significant properties explaining the response of GRSP to temperature. GRSP was more sensitive to temperature than SWR and SOC at low temperatures. Our results indicate that GRSP could be a useful indicator of fire severity.

Key words: Arbuscular mycorrhizal fungi; Glomalin related soil protein; Soil water repellency; Soil aggregates.

References:

Wright, S.F, Upadhyaya, A., 1996. Extraction of an abundant and unusual protein from soil and comparison with hyphal protein of arbuscular mycorrhizal fungi. *Soil Sciences* 161, 575–586