



Fire effects on soil organic carbon in turn affecting physical, chemical and biochemical soil properties

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Organic matter plays a key role in mineral soils, affecting most soil properties. Fire can affect soil organic matter both quantitatively and qualitatively, depending on fire severity, and post-fire erosion processes. In this work we have assessed some soil physical chemical and biochemical properties in the following three adjacent areas: 1- an area affected by a wildfire in 1987; 2- an area that has been affected by two wildfires (1987 and 2005) and 3- a control (unburned) area. The three sites are located in the Province of Alicante (southeast of Spain), with similar characteristics (pre-fire vegetation: *P. halepensis* forest, soil type: Lithic Xerorthent, slope: $\approx 5\%$, and aspect: SE). Soil sampling was carried out in November 2006 and the following parameters were analyzed: organic carbon, pH, electrical conductivity (EC), cation exchange capacity (CEC), water holding capacity (WHC), aggregate stability (AS), available phosphorous (P), and the enzyme activities: urease, phosphatase and β -glucosidase.

The results show that organic carbon in both areas affected by fire was lower than the control values. Statistical differences were also found for the rest of studied soil properties. Lower values of AS, WHC, CEC, EC, P and enzyme activities and a higher pH reflect soil degradation in the area affected by the fire in 1987. The area affected by the two fires does not show significant differences with respect to the area affected by the 1987 fire. Significant correlations between organic carbon with all studied parameters reflects its important role in forest soils, and how the loss of soil organic matter can affect the soil quality.

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