



Short-time effect of salvage harvesting on microbial soil properties in a Mediterranean area affected by a wildfire: preliminary results

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In the Mediterranean region, wildfires are considered one of the main ecological factors, which, in addition to and in relation to changes in soil use, may cause soil loss and degradation, one of the most important environmental problems that humanity must face up to. As is well known, the soil-plant system is one of the key factors determining ecological recovery after the occurrence of a wildfire. Traditionally, a variety of forestry practices have been implemented on Spanish sites after the incidence of a wildfire. Among them stands out the complete extraction of the burned wood, which consist in getting rid of the branches and other wooden debris using small controlled bonfires, splintering or mechanical extraction. This set of post-fire management practices is known as salvage logging or salvage harvesting.

Despite the remarkable relevance and influence that this conjunction of techniques has on land management after a wildfire, very little experimental research focused on assessing the impact of salvage logging on the vegetal community has been done. Furthermore, even less research inquiring into the mode and grade of incidence that the salvage logging produces on soil properties has taken place. The aim of this research is to assess the effects that the salvage harvesting has on different soil microbial properties and other related properties.

The study area is located in the Natural Park of the “Sierra de Mariola” in the province of Alicante, south-eastern Spain. This location was affected by a wildfire whose extension reached more than 500 Ha in July 2012. Different post-fire treatments were proposed by the authorities, including salvage harvesting in some areas. Two different treatments were distinguished for the study, “control” (without any kind of burned wood removal) and “harvest” (where salvage logging was carried out), in each area three 4 m² sampling plots were set up. These two treatments were established on the same slope with the same orography, aspect and soil. Soil samplings were done before the salvage logging work and three months later. Different physical, chemical and biological soil properties were analyzed in the laboratory, but in this work we show basal soil respiration (BSR), microbial biomass carbon (MBC), soil organic carbon (SOC) and bulk density (BD).

The results showed a clear increase in the bulk density in the “harvest” plots in contrast to the “control” plots, meaning that the soil is being compacted due to the forestry treatment applied. No significant differences between treatments in the content of soil organic carbon have been observed. However, the analyzed microbial parameters (BSR and MBC) denote a clear decrease both in microbial activity and in the quantity of the microorganisms present in the “harvest” plots soil. This is presumably due to the compacting process that is going on, and the effects of the recovery of vegetation as these indicators (BSR and MBC) respond rapidly to any kind of soil perturbation. This study will continue monitoring with more soil samplings in order to study the effect of this type of treatment in the medium-term.