



Microbial response following straw application in a soil affected by a wildfire

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Mulching treatment is often recommended to reduce post-fire erosion and sediments yields but information concerning their effects on soil microorganisms is scarce. In the present investigation the evolution of several parameters related with the mass and activity of soil microorganisms was examined in a hillslope shrubland located in Saviñao (Lugo, NW Spain) and susceptible to suffer post-fire erosion (38% slope). In this area, affected by a medium-high severity wildfire in September 2012, different treatments with wheat straw applied to the burnt soil in mulch strips (800 and 1000 kg ha⁻¹) were established by quadruplicate (10 m x 40 m plots) and compared with the corresponding burnt untreated control. Soil samples were collected from the A horizon (0-2.5 cm depth) at different sampling times over one year after the wildfire and different soil biochemical properties (microbial biomass C, soil respiration, bacterial activity, [U+F062]-glucosidase, urease and phosphatase activities) were analyzed. The results showed large variation among the four field replicates of the same treatment (spatial variability), which makes difficult to evaluate the effect of mulch treatment. The evolution of the different biochemical properties in the post-fire stabilization treatments with the wheat straw applied in mulch strips were mainly related to the time passed after the fire (short- and medium- term changes in soil physical and chemical properties induced by both fire and climatic conditions) rather than to the straw mulching effects; in addition, a different temporal pattern was observed depending on the variable considered. The results pointed out the usefulness of examining intra-annual natural variability (spatial variation, seasonal fluctuations) when different indices of mass and activity of microorganisms were used as monitoring tools in soil ecosystems affected by fire.

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