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Quantification and characterisation of charred materials in two recently burned pine forests in Tuscany, Central Italy.

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Pine forests are common in the Mediterranean basin. Wildfires are both a threat and a main factor for their survival. In fact they can destroy entire forests but they also promote pine renovation by allowing the opening of the cones and by enhancing seed germination. The release of charred materials to soil during wildfires is a relevant stabilization process for soil organic matter in Mediterranean soils, but only when the land use do not change and the vegetation recovers the pre-fire status. In addition, not all of the charcoal released to the soil represents a lasting net increment of stable C. Actually, a not negligible fraction of charcoal is preferentially eroded or undergoes to biotic and abiotic degradation processes that are still relatively unknown. Even though fire-prone coastal pine forests of Italy are carefully preserved, the effects of wildfires on soil organic matter have been rarely examined in these biomes. We studied two recently burned forests of *Pinus pinaster* Ait. and *Pinus pinea* L. of Tuscany, Central Italy, both growing on sandy soils developed on marine deposits. The two forests have different fire histories, the first one being burned several times in the last 30 years while the second was never burned in that period. The comparison of paired burned and unburned plots in both sites allowed assessing the effects of fire on the quantity and quality of soil organic matter by dry and wet oxidation and solid state ^{13}C NMR spectroscopy.

Keywords: charcoal, forest soil, pine, soil organic matter, wildfires.