



8000 years of fire-induced molecular modifications in Campo Lameiro (NW Spain)

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Different types of burning residues are collectively referred to as black carbon (BC). Black C is among the most recalcitrant organic C forms in soils, and is therefore potentially important in the global C cycle. Nonetheless, molecular-level modifications of BC over long periods are hardly investigated. We applied pyrolysis-GC/MS to 28 samples from a soil profile that harbours a fire record of at least 8000 years, and a large amount of organic C.

The area of Campo Lameiro harbours one of the greatest concentrations of Bronze age rock art in Spain. By means of the creation of the future *Rock Art Part of Campo Lameiro*, it is meant to become a major tourist attraction. While biomarker-evidence of ancient crop cultivation and stock-breeding systems in the area were looked for, it seemed likely that any such signal was disturbed by the intense fire regime of the area. This conclusion was drawn from (1) the presence of three charcoal layers indicating wildfires, (2) the predominance of benzenes and non-benzene aromatics in the pyrolysate ($79 \pm 6\%$), (3) the shortage of markers of intact carbohydrate and lignin despite of the probably slow biodegradation, and (4) the detection of black carbon markers in a selection of samples analysed by TMAH thermochemolysis.

Traditionally, the slow degradation of organic matter in the soil is attributed to sorptive preservation through the formation of Al-humus complexes. Our results indicate that charring may act as an alternative or complementary force in organic matter preservation in the area.