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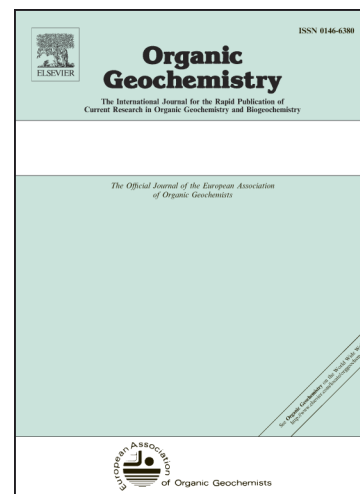
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Long-term degradation effect on the molecular composition of black carbon in  
Brazilian Cerrado soils

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ABSTRACT

The effect of long term degradation on soil black carbon (BC) is important for correctly interpreting the role of BC in the global carbon cycle and in biochar studies. To address this, we studied three soil profiles (0–2 m depth, > 9000 yr) in undisturbed Brazilian Cerrado vegetation naturally affected by wildfires. The molecular composition of several soil organic matter (OM) pools was studied using analytical pyrolysis. Other analyses included general chemical and physical characteristics and micromorphology. The soil OM fractions included the free light fraction (FLF; particulate OM), the occluded light fraction (OLF; particulate OM within aggregates), the 0.1 M NaOH extractable OM (EXT; comparable with the combined humic acid and fulvic acid fractions) and the remaining residue (RES; treated with HF/HCl; comparable with the humin fraction). Although each fraction represents a continuum of material, they were assigned a different degradation level. The light fractions represent relatively intact BC (i.e. charcoal) of which the OLF is more degraded than the FLF, the EXT

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