Dynamics of Organic Carbon in a Humid Forest Soil Profile. (S05-mayes092547-Poster)

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Abstract:

The rise in atmospheric CO2 has directed attention to the function and potential of terrestrial soils for carbon sequestration. The movement of organic carbon to depth is controlled by biotic activity, climate, hydrologic and geochemical characteristics of the soil profile. The goal of this research was to quantify the transformation of organic carbon in two profiles within a humid region forest Ultisol using molecular characterization techniques. Samples were taken as a function of depth within distinct mineral horizons. The lipid component was extracted from the soils and analyzed by GC-MS. Three types of resistant biomarkers were identified, odd-carbon n-alkanes and alkanoic acids, sterols and hopanoids. The compounds can be attributed with varying degrees of certainty to higher plants, or to microbial/fungal degradation of simple organic compounds. In the B horizon, the biomarkers were not identifiable by GC-MS, probably due to condensation into higher molecular weight compounds and sorption to iron-rich soils. These initial results are promising and suggest that additional extraction techniques may be capable of resolving molecular-scale transformations in soils.

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