Extraction of Humic Acid Fractions Based on Binding to Soil Polyvalent Cations. (S02-olk222803-Poster)

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Abstract:

Stabilization of soil organic matter by polyvalent cations was the basis for a humic acid fractionation applied here to nutrient cycling studies. Soil was first extracted by NaOH to recover the mobile humic acid fraction (MHA), then washed by HCl for decalcification, followed by NaOH extraction to recover the calcium humic acid (CaHA) fraction. Fractions were analyzed by 13C, 31P, and 15N NMR, ESR spectroscopy, elemental analysis, pyrolysis-GC-MS, and visible light absorption for a California cotton soil and tropical rice soils varying in cropping intensity. All analyses found the MHA was composed of labile materials, while the CaHA was more humified. Addition of the MHA to the vermiculitic California soil reproduced the positive effect of animal manure application on K availability in the field, while the CaHA had no effect. In the rice soils, both fractions responded in quality and quantity to crop management and were more involved in short-term N cycling than was bulk organic matter, especially the MHA. The MHA is enriched in both N and lignin residues and appears suitable for studying their chemical interactions.

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