



Characteristics of organo-mineral associations in Dajiuhu peatland, central China

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Organo-mineral associations are considered to be an effective mechanism in the long-term preservation of organic matter (OM) in soil, which is of great importance for the global carbon cycle. However, organo-mineral associations are rarely studied in peat soils. These soils are rich in OM, and the main mechanism of OM preservation is reduced decomposition rates due to anoxic conditions. Yet the soils can contain also clay minerals, so that organo-mineral associations may also contribute to the characteristics and preservation of OM in the soils.

In this study, we investigate the peat core in Dajiuhu peatland in Hubei Province, central China. The soil profiles at the study site is characterized by horizons with varying clay mineral content. By comparing OM characteristics between clay and bulk soil samples from different soil horizons, we aimed at gaining a first insight into how the formation of organo-mineral associations affects the cycling of OM at the site. We used ¹³C-NMR, gas chromatography–mass spectrometry (GC–MS), trace GC instrument coupled to isotope ratio mass spectrometer (GC–IRMS) and thermo-gravimetry (TG) to demonstrate the dynamics of OM in peat soil.

Using NMR we found smaller O-alkyl C to alkyl C ratios in clay fractions than in bulk soil samples, suggesting that OM components rich in alkyl C preferentially contribute to organo-mineral associations, and thus may preferentially be preserved via sorptive protection in peat. Evaluation of the other results is currently underway and will be presented at the conference.