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**436-4 Influence of Microbial Fe (III) Reduction on Dom Sorption Under Anoxic Condition.**

**Poster Number 1129**

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*Wednesday, November 5, 2014*

*Long Beach Convention Center, Exhibit Hall ABC*

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Sorption of dissolved organic matter (DOM) with Fe oxides has been proposed to be an important geochemical process for carbon preservation and carbon cycling. Microbial reduction of iron mineral primarily occurs in the anoxic environments, such as wetlands and sediments with high inputs of organic matter. Many studies have investigated the DOM sorption with iron minerals under oxic conditions. In contrast, there have only been a handful of studies that have looked at DOM sorption associated with biotic iron reduction under anoxic conditions. The factors controlling the kinetics of DOM sorption as related to microbial iron reduction are still poorly understood. In this study, two natural DOMs of contrasting compositions (decomposed and labile) were used to investigate the impact of DOM chemical composition on sorption under anoxic conditions. The influence of reductive dissolution and transformation of Fe (III) oxides on sorption were investigated by inoculating Fe-reducing *bacteria Shewanella putrefaciens* strain MR1. DOMs and Ferrihydrite minerals were sampled periodically over a 12-day incubation. In terms of reactivity, the labile DOM results in faster Ferrihydrite reduction rates and larger extent of bioreduction. The bioreduction also altered the mineralogy of iron oxides. The chemical composition of labile DOM was largely altered by the activity of *Shewanella*. We observed an increasing trend of aromaticity and humification for labile OM over the course of incubation. Such change of OM properties improved the sorption affinity for labile OM. We found that the chemical composition of OM was critical for anoxic DOM sorption. Not only was the Fe(III) reduction rate altered but the mineral products could also be changed with different DOM compositions. In summary, this study showed that DOM sorption under anoxic condition was largely determined by the extent of microbial iron reduction.

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