

Microbial influence on sorption of heavy metals to Fe-, Mn-, Al-(oxy)hydroxides



Institution Institute of Geoscience

[Applied Geology](#)

Address:

Burgweg 11 (Room H217)

07749 Jena

Germany

Email: sathish.mayanna@uni-jena.de

Telephone: +49 (0)3641/948669

Fax: +49 (0)3641/948622

Sathish Mayanna

Webpage: <http://sathish-mayanna.yolasite.com/>

Heavy metal pollution has become one of the most severe environmental problems since the beginning of the industrial revolution. In particular, the former Uranium Mining (UM) area near Ronneburg, Germany resulted in widespread environmental contamination with high concentrations of heavy metals and radionuclides. Previous research in the UM Ronneburg area shows that natural attenuation of heavy metals is occurring in Fe-/Mn-oxide rich soil horizons, which share characteristics with a geochemical barrier at pH 5.5 and 7. Microorganisms are known to play a pivotal role in the mobilization and immobilization of heavy metals in the ecosystem. However, the mechanism of heavy metals retention/dissolution in geochemical barrier via microbes and pH is relatively unclear, but it has been demonstrated that both living and non-living biomass may be utilized in biosorptive processes, as they often exhibit a marked tolerance towards metals and other adverse conditions. In addition, certain metal oxidizing and reducing microbes are significant in the structure and formation of secondary minerals. Since, microbial formation of Fe/Mn-oxides is much faster than oxides forming via abiotic processes thus; this study focuses on the impact of microbes on the heavy metal retention in the secondary mineral enriched layers within the epigenetic zones of geochemical barriers. State of art analytical and molecular techniques will be applied to elucidate the above objectives. Ultimately, this will lead us to unravel the mechanism of heavy metal retention/dissolution and formation of secondary precipitation in geochemical barrier, which is a

challenge in the realm of environmental pollution, bio-sorption and bio-remediation.



Soil Profiling

Secondary Mineral Enrichment