Aug 9th, 10:15 AM - 12:00 PM

Biological effects on serpentinite weathering

Mary H. Evert  
Otterbein University

Julie Baumeister  
University of Nevada, Las Vegas

Elisabeth Hausrath  
University of Nevada, Las Vegas, elisabeth.hausrath@unlv.edu

Repository Citation

This Event is brought to you for free and open access by the Undergraduate Research at Digital Scholarship@UNLV. It has been accepted for inclusion in Undergraduate Research Opportunities Program (UROP) by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact digitalscholarship@unlv.edu.
Serpentinites, perhaps more than any other rock type, control the composition and evolution of the surrounding ecosystems. The bulk chemistry of serpentinite rocks, high in Mg and trace elements, and low in nutrients such as Ca, K, P, and N, causes an extreme and stressful environment for ecosystems. However, the role that these serpentinite ecosystems play in development of serpentine soils has not been examined.

Due to the unusual chemistry of serpentine soils, serpentine ecosystems have deeper and better-developed root systems than other ecosystems. The rhizosphere of serpentine systems, documented to produce abundant organic acids and siderophores, is also likely to impact serpentine soils. In order to examine the effects of biological impacts on serpentine soil formation, soil pore waters were analyzed for organic acids. Furthermore, Fe-oxidizing bacteria have been detected using Biological Activity Reaction Tests (BARTs) and such bacteria were investigated by enrichment cultures. In addition to directly testing the effects of biological factors including organic acids, siderophores, and Fe-oxidizing bacteria, the impact of such weathering on soils and rock was examined using XRF, XRD, and SEM.

**METHODS**

- **Sample Collection**: Samples were stored in the refrigerator after collecting from soil pits and rock cores.
- **Mineral Content**: XRF: Analyzed from powdered samples. SEM/EDS: Analyzed from epoxy embedded and polished samples.
- **Siderophores**: UV-VIS: Pore water samples will be mixed with a CAS assay and analyzed.
- **Bacteria**: Biological Activity Reaction Tests (BARTs): Mixed samples with a phosphate-buffered saline solution and observed over time.
  
**ACKNOWLEDGEMENTS**

We would like to thank the National Science Foundation Research Experience for Undergraduates program A Broad View of Environmental Microbiology at the University of Nevada, Las Vegas (DBI-1005523) for funding and UNLV Department of Geoscience and UNLV School of Life Sciences for their support. We would also like to thank Chris Amsel, Kurt Regner, Jari Batista, Jared Gore, and Dennis Bazylinski for their assistance with materials and lab use.

**REFERENCES**