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A community survey of symbiotic mine site fungi along a gradient of recovery on mine sites in the Carolinas

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ABSTRACTS – Posters

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In the Anthropocene an increasing part of terrestrial environments is losing ecosystem services and function. This negatively affects both human economics and ecological systems. Phytoremediation, the use of plants to reverse degradation and to restore ecological function, has been a promising approach. However, the symbiotic soil microbiota that influence the effectiveness of this method is not fully understood. I sampled the soil and roots of *Pinus* spp. (pines) at four sites along a gradient of vegetation recovery on the Superfund Site Brewer Gold Mine (SC), the Henry Knob Mine (SC), and Russell Gold Mine. Acidity, nutrient profile, and heavy-metal contamination of collected soil were determined. DNA was extracted from soil and root samples followed by preparation of multiplex PCR samples of the ITS region. Sequence reads generated through Illumina Miseq were processed through the QIIME pipeline. Taxonomy was assigned through the UNITE database. Results showed a pattern of succession in fungal communities along a recovery gradient. While mycorrhizal fungi on the least recovered site were dominated by *Acephala* and *Pisolithus*, sites with more recovered vegetation revealed a more diverse array of symbiotic fungi, including *Rhizopogon*, *Tomentella*, *Tricholoma,* and *Laccaria*. These fungi, although later in the succession pattern, likely add more diverse benefits to help their plant associates cope with the stressful environment. This "bioprospecting" method could be applied to extract and amplify symbiotic fungi to facilitate re-vegetation efforts.