

Abstract 2 for Rhizosphere Conference (*E. coli* challenge),

Title: Does seed sanitization affect the plant rhizosphere microbiome and its ability to compete with the human associated pathogen, *E. coli* on salad crops?

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Cultivation of crops in controlled environmental agricultural systems may limit microbial colonization and reduce diversity of the microbial communities. Practices like seed and growth medium sanitization may further impact microbial communities in the mature plant and the plant's capacity to limit the growth of pathogens through competition. As humans expand their travels to space, understanding plant growth, health, and development in closed environments will be critical to the success of producing a safe, supplemental food source for astronauts. To determine the persistence of a potential human pathogen in plant growth and development, sanitized and unsanitized seeds from, mizuna (*Brassica rapa* var japonica) and red romaine lettuce (*Lactuca sativa* cultivar 'Outredgeous'), were inoculated with *Escherichia coli*, ATCC 21445, germinated under simulated International Space Station (ISS) environmental conditions and harvested every 7 days until maturity. The persistence of *E. coli* in the rhizosphere was determined by plating on selective media, real time PCR and community sequencing of the rhizosphere communities. *E. coli* was detected in the crops' roots and leaves for several weeks post germination. At day 28, plants from sanitized seeds had significantly higher counts of *E. coli* on the roots than those from unsanitized seeds. *E. coli* was also detected on a few uninoculated plants indicating air borne cross contamination among plants in the same growth chamber and suggesting an influence of the natural microbiome on human pathogen survival and persistence in leafy greens. Sequencing analysis revealed variations in composition and diversity between the communities. Understanding the microbial community of the rhizospheric microbiome is only the first step in determining the relationships between plants. Additional studies to include genotypic and phenotypic variations in the plants should be considered to determine if the natural microbes in the rhizosphere may contribute to the health and therefore, safety of the edible plants.