

**Title:** Determining the efficacy of a red yeast, *Sporobolomyces pararoseus*, as a biological control agent on leafy greens

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**Overview:** Various pesticides and antimicrobials are used in the produce industry to prevent or reduce the growth of spoilage organisms and/or human and plant pathogens. The presence of these chemicals poses an environmental risk, as well as the potential for the target organism(s) to develop resistance to the treatment. *Sporobolomyces pararoseus* is a cosmopolitan red yeast with a global distribution that is ubiquitous on healthy plant phylloplanes and harmless to animals and humans. This work examined, when used as a foliar spray, if the yeast is able to outcompete any other introduced pathogenic bacteria for physical space within the plant phylloplane..

Romaine lettuce was sprayed with several formulations of *Sporobolomyces pararoseus* either before or after the introduction of various concentrations of *Listeria monocytogenes*, *Salmonella* spp., and *E. coli* O157:H7. The plants were then sampled and the microorganisms that were added to the plants enumerated to determine the survivability and persistence compared to that of control plants. Overall, *Sporobolomyces pararoseus* was able to reduce the growth of *Salmonella* spp. on the surface of romaine lettuce. There was also inhibition of *E. coli* O157:H7 growth on the lettuce samples tested (Figure 1). This work shows promise that *Sporobolomyces pararoseus* may be used as a biocontrol agent and future work will include greenhouse studies where the concentration and spray rate for application of the yeast can be optimized. This could eliminate or greatly reduce the need for pesticides and post-harvest processing chemicals currently used in the fresh produce industry.

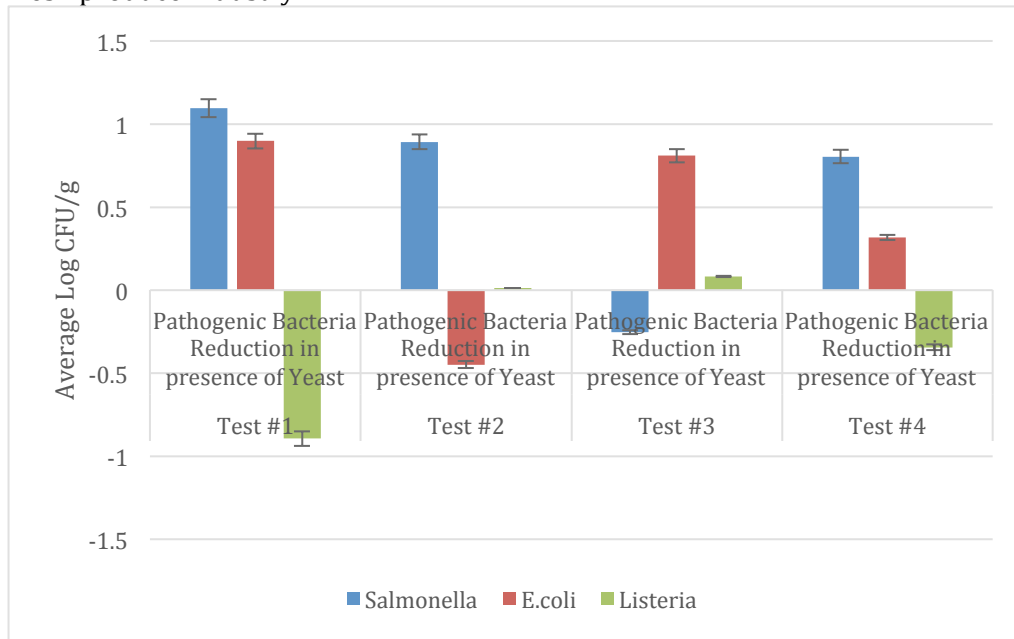


Figure 1: Average log reduction of human pathogenic bacteria grown in the presence of *Sporobolomyces pararoseus* on romaine lettuce