

HAFL Master's Thesis Abstract

Year: 2021

Student's Name: Daniela Albarracin

English Title: **Protective cultures as alternative strategy for the bio preservation of fruits and vegetables based on the model "strawberry"**

English Summary:

Intensive agriculture practices demand effective pest control for profitability. In addition to traditional methods, there is a market segment for bio products that does not employ synthetic disease control agents. It is therefore of importance to analyze and identify bio control solutions that are effective against diseases, particularly relevant in high cost-of-labor crops such as strawberries.

The present work is focused on devising biological treatments against *Botrytis cinerea*, a common fungus that easily appears and spreads across crops around the world. Work is centered around identifying food-safe bacteria which exhibit fungi-regulator characteristics and assess its performance on lab and field conditions.

This work describes the preparation of a suitable, realistic medium for assessing fungi growth in a strawberry-like surface, alongside the mechanism for identification of naturally occurring bacteria in the fruit extracted from commercially available samples. An isolation and classification procedure were then carried out, determining several effective candidates for *in vitro* assessments. Assays of bacteria fungi-suppressions effects against *B. cinerea* are performed, and six bacteria species are chosen. *In-vivo* field and pot trials are done exploring a combination of spray and root-inoculation treatments.

Selected bacteria were *Staphylococcus equorum*, *Microbacterium spp.*, *Fictibacillus enclensis*, *Bacillus megaterium*, *Rouxiella badensis* and *Serratia plymuthica*. *In vitro* results show potential for these bacteria in treating this disease. Up to 90% mycelium reduction was observed in dual assays in LB medium and up to 40% in PDA; germination assays showed up to 30% inhibition of the mycelium. *In vivo* results did not sufficiently determine these capabilities. A combination of climatic factors during the essays hindered the natural growth season and the treatment applications potential effectiveness. Further work is needed to be able to ensure if any of the evaluated bacteria have real potential as biocontrol agents, either in the field or in a post-harvest stage.

Keywords: *Botrytis cinerea*; biological disease control; fungicides; *Fragaria ananassa*

Principal advisor: Elisabeth Eugster