In Vitro Bio-Assay Testing of PROMAX® Efficacy in Controlling Strawberry Pathogens

Laboratory Report

Plant Sciences, Inc.

Objective

Test the efficacy of Promax® for inhibiting mycelial growth of 8 fungal strawberry pathogens through *in vitro* bio-assay.

Methods

Potato dextrose agar was amended with Promax® at a rate of 2% after autoclaving and cooling to 55°C on a stir plate. The amended media was poured into Petri plates and, once cooled and solidified, they were inoculated with 8 economically important strawberry pathogens (*see list, next column*). Plates were inoculated by placing a 5 mm mycelial agar plug, taken from actively growing culture, onto the center of the amended media. Non-amended agar plates were also inoculated as a negative control treatment. For each treatment by pathogen combination, three replicate plates were inoculated. The plates were incubated at 20°C for 2 weeks. The diameter of each mycelial colony was measured weekly. The % inhibition by the test chemical was calculated using the difference between the mean of replicates in the negative control group and the treated group.

The following 8 fungi and fungal-like pathogens were tested:

- *Botrytis cinerea*
- *Colletotrichum acutatum*
- *Cylindrocarpon destructans*
- *Fusarium oxysporum f. sp. fragariae*
- *Macrophomina phaseolina*
- *Phytophthora ramorum*
- *Rhizoctonia solani*
- *Verticillium dahliae*

Results

After 1 week of incubation, all 8 pathogens tested were completely inhibited from mycelial growth in media amended with 2% Promax® (*see photos, pages 2 and 3*). After 2 weeks, 7 of the 8 pathogens were still 100% inhibited. *Verticillium dahliae* began to grow a little after 2 weeks; the mean percentage inhibition of *V. dahliae* was 94% after 2 weeks (*Figure 1*).

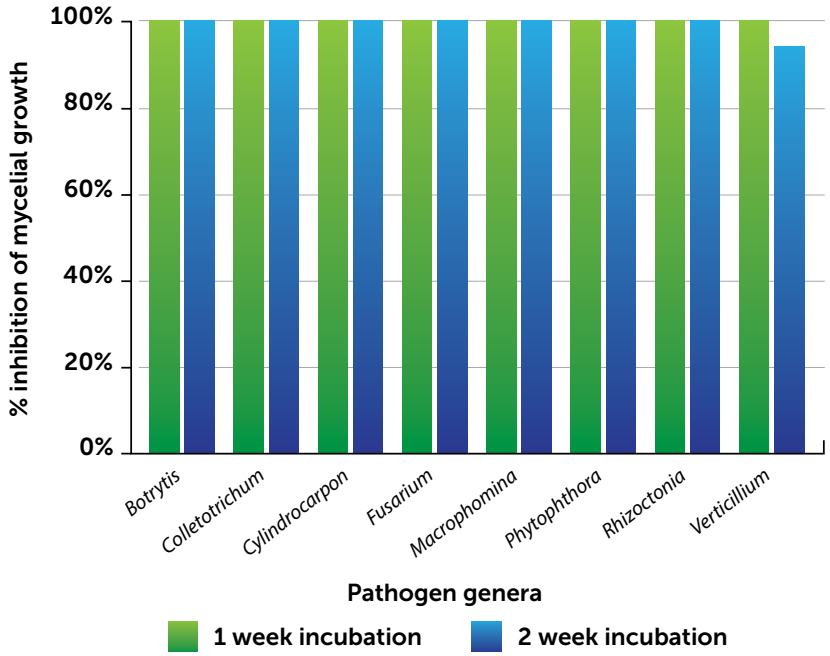

Figure 1. % Inhibition of Mycelial Growth of 8 Strawberry Pathogens *In Vitro* Using Agar-Based Media Amended With 2% Promax®

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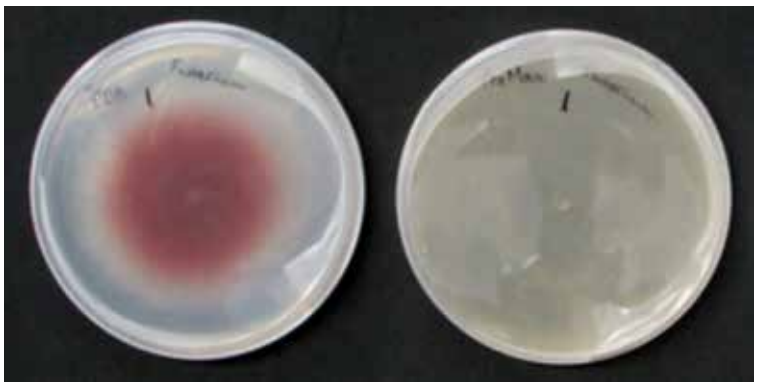
The following photographs were taken after 1 week of incubation time at 20°C
(by 2 weeks some pathogens had reached the edge of the plates).

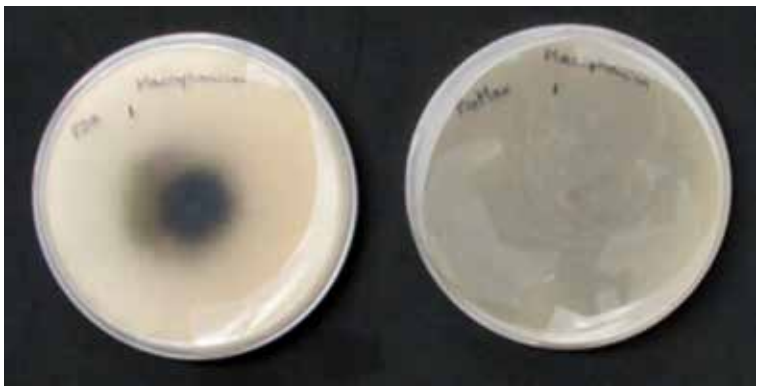
Fusarium oxysporum f. sp. fragariae

Negative control 2% Promax®



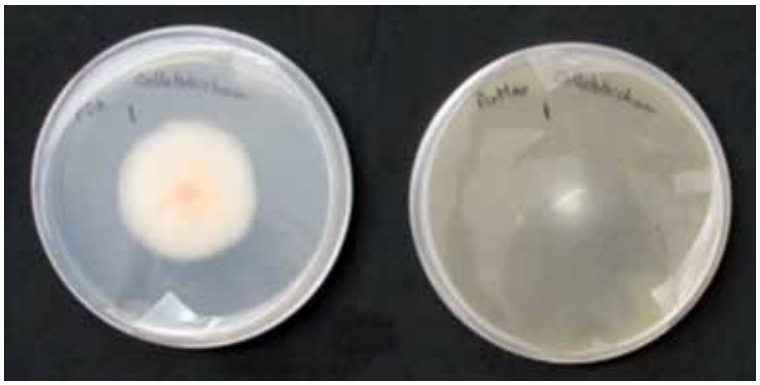
Macrophomina phaseolina

Negative control 2% Promax®



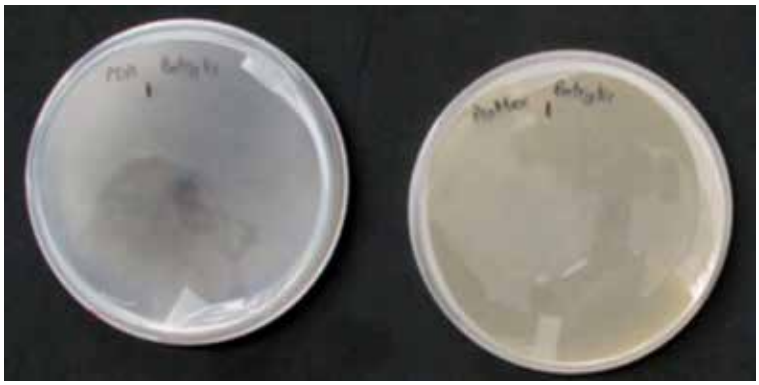
Colletotrichum acutatum

Negative control 2% Promax®



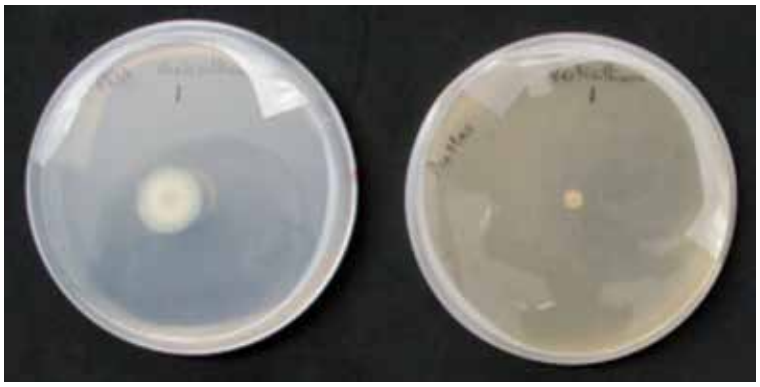
Botrytis cinerea

Negative control 2% Promax®



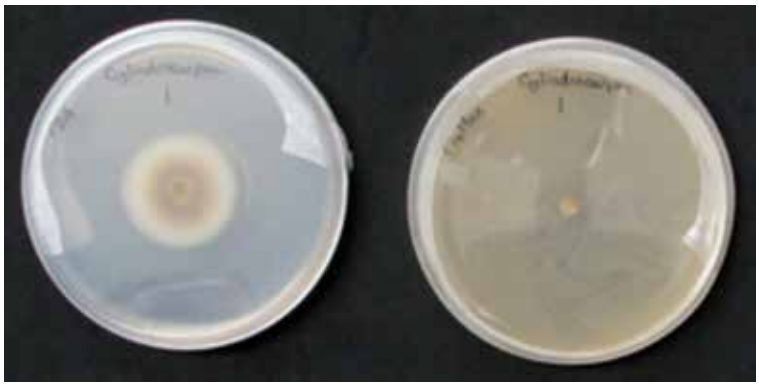
Verticillium dahliae

Negative control 2% Promax®



Cylindrocarpon destructans

Negative control 2% Promax®



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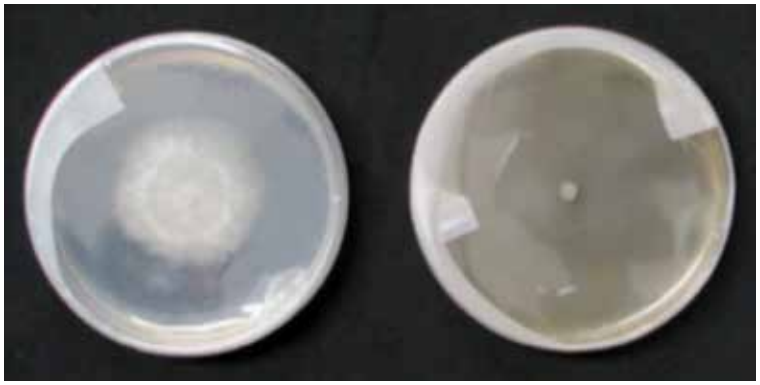
Phytophthora cactorum

Negative control | 2% Promax®



Rhizoctonia solani

Negative control | 2% Promax®

Conclusions

Promax® was highly effective in *in vitro* control of these 8 strawberry pathogens.

For more information on Promax®, go to www.promaxprotect.com.

For more information on other Huma Gro® products, go to www.humagro.com.

Huma Gro® Research Reports, Field Studies, and Testimonials may be found at https://humagro.com/case-studies/.

The Huma Gro® Product Catalog may be viewed at http://bit.ly/HumaGroCatalog2017.

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