

# SELECTION OF MICROORGANISMS FROM SUPPRESSIVE COMPOST TO CONTROL SOIL-BORNE PATHOGENS ON POTTED VEGETABLES

**M. Pugliese<sup>\*,\*\*</sup>, M. L. Gullino<sup>\*,\*\*</sup>, A. Garibaldi<sup>\*</sup>**

<sup>\*</sup>University of Torino, Centre of Competence for the Innovation in the agro-environmental sector (AGROINNOVA), Largo Paolo Braccini 2, 10095 Grugliasco (TO), Italy

<sup>\*\*</sup>DISAFA, University of Torino

Soil-borne diseases are the cause of severe losses of economically important crops and the use of organic amendments and compost is an alternative approach for their control. Compost suppressiveness has been widely studied, suggesting an important role for the microbial component of compost and the possibility to isolate antagonists from high quality composts.

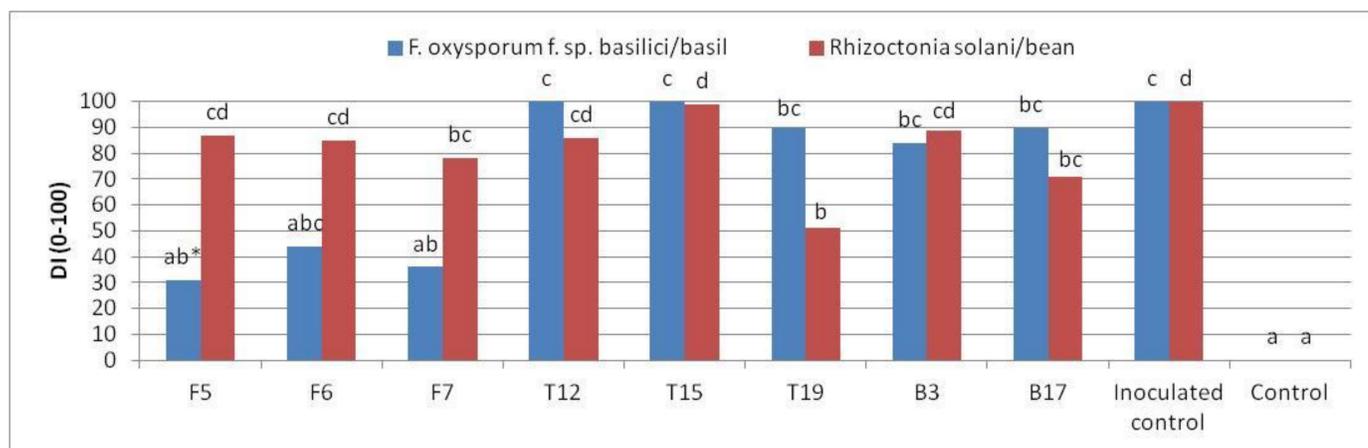
The objective of the present work was to isolate microorganisms from a suppressive compost and to test them for their activity against soil-borne pathogens on vegetable crops.

A compost from green wastes and municipal biowastes that showed a good suppressive activity in previous trials was used as source of microorganisms.

Serial diluted suspensions of compost samples were plated on different media: selective for *Fusarium* sp., selective for *Trichoderma* sp., potato dextrose agar (PDA) for isolation of fungi, lysogeny broth (LB) for isolation of bacteria. Colonies were isolated from plates and tested in greenhouse on potted plants against *Fusarium oxysporum* f. sp. *basilici*/basil, *Pythium ultimum*/cucumber and *Rhizoctonia solani*/bean.

Antagonistic microorganisms were blended into a peat substrate at 10 g L<sup>-1</sup> or 10 ml L<sup>-1</sup> 14 days before seeding. Pathogens were mixed into the substrate at 1 g of wheat kernels L<sup>-1</sup> 7 days before seeding. Seeds of basil, cucumber and bean were sown into 2 L pots in greenhouse. The number of alive plants and above ground biomass were measured 20-30 days after seeding.

Figure 1: Activity of the best microorganisms isolated from compost against *Fusarium oxysporum* f. sp. *basilici* and *Rhizoctonia solani* on potted basil and bean plants.



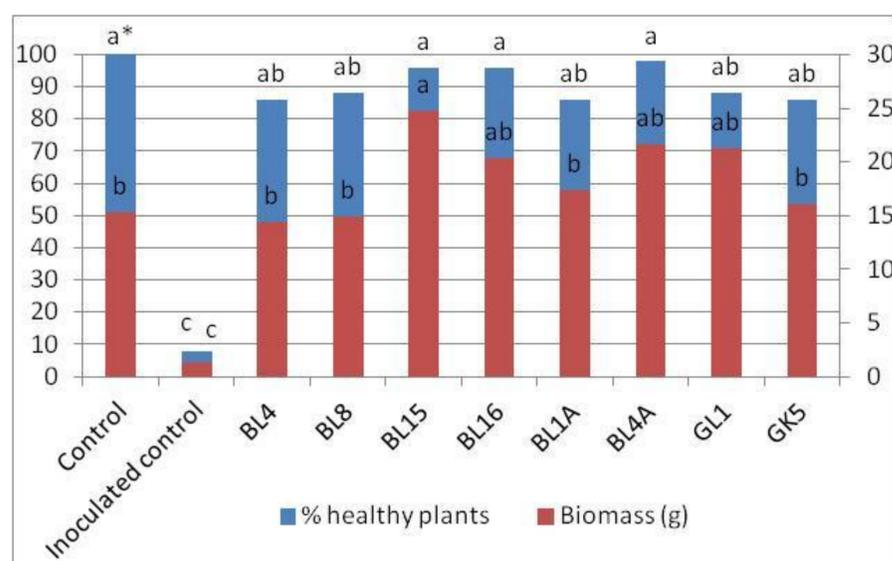
\* Tukey's HSD test ( $P < 0.05$ )

Three fungi were able to significantly control *F. oxysporum* f. sp. *basilici* on basil and one of them was effective also against *R. solani* (Fig. 1).

Other 8 microorganisms, including 6 bacterial strains and 2 fungi, significantly increased the number of alive plants in the pathosystem *P. ultimum*/cucumber (Fig. 2).

Among all isolated microorganisms, bacterial strains showed to significantly control the pathogens better than fungi. However none of the microorganisms was able to control the three soil-borne pathogens together.

Figure 2: Activity of the best microorganisms isolated from compost against *Pythium ultimum* on potted cucumber plants.



\* Tukey's HSD test ( $P < 0.05$ )