

Evaluation of antifungal activity of food additives against soilborne phytopathogenic fungi

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Abstract

The efficacy of eight food additives as possible alternatives to synthetic fungicides for the control of soilborne pathogens, *Fusarium oxysporum* f. sp. *melonis*, *Macrophomina phaseolina*, *Rhizoctonia solani*, and *Sclerotinia sclerotiorum* was evaluated in this study. A preliminary selection of food additives was performed through in vitro tests. The ED₅₀, minimum inhibition concentration (MIC), and minimum fungicidal concentration (MFC) values showed that ammonium bicarbonate and potassium sorbate were more toxic to soilborne pathogens compared to other food additives with few exceptions and, therefore selected for further testing in soil. The inhibitory and fungistatic efficacy potassium sorbate were higher than that of ammonium bicarbonate in in vitro tests. Potassium sorbate completely inhibited *F. oxysporum* f. sp. *melonis*, *M. phaseolina*, and *R. solani* at 0.6% in soil tests. In contrast ammonium bicarbonate at 0.6% was inferior compared to potassium sorbate. Ammonium bicarbonate achieved to control all fungi at 2% that is the highest concentration used in this study. Potassium sorbate showed higher toxicity to all fungi compared to ammonium bicarbonate in soil tests. Both ammonium bicarbonate and potassium sorbate increased the pH of soil. The rate of pH increase was higher in ammonium bicarbonate.