

Title Biological control of apple gray mold caused by *Botrytis mali* with *Pseudomonas fluorescens* strains

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Abstract

Two hundred and ten *Pseudomonas* spp. strains were obtained from leaf surfaces and apple fruit using serial dilution methods on semi-selective King B medium. These strains were screened in vitro against *Botrytis mali*, a casual agent of gray mold of apple. *B. mali* was originally described in the state of Washington and has been recently revived in British Columbia, Canada. When compared to *Botrytis cinerea* it differs by producing smaller sclerotia and has a different DNA sequence on the β -tubulin gene. Ten promising *Pseudomonas fluorescens* strains from the 210 *Pseudomonads* were selected and evaluated as potential biocontrol agents for control of gray mold on apple in vitro and in vivo. Dual culture, cell free metabolite and volatile tests showed that all 10 strains of *P. fluorescens* inhibited growth of *B. mali*. Inhibition varied from 49% to 68% in the dual culture tests; 75–99% in the cell free metabolite tests; and 52–97% in the volatile tests. Apple fruit wounds were inoculated with 20 μ L of a bacterial suspension (10^{11} CFU L⁻¹) of *P. fluorescens* followed 48 h later by *B. mali* (10^8 conidia L⁻¹). The apples were then incubated at 20 °C for 20 d or at 5 °C for 25 d. All 10 fluorescent *Pseudomonads* appeared to be good antagonists of gray mold on apple at 20 and 5 °C. *P. fluorescens* strain Pf1 appeared to be the best biocontrol agent preventing *B. mali* from expanding to no more than 0.6 cm² compared to 14.5 cm² for the control at 5 °C.