

Title Characterization of cold-adapted rhizobacteria for control of postharvest fungal decay of pome fruit

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Citation ISHS Acta Horticulturae 905:181-188.2011.

Keywords *Penicillium expansum*; *Botrytis cinerea*, *Mucor piriformis*; temperature; carbon source; pH; cell-free supernatant

Abstract

Fungal decay during postharvest storage of fruit leads to significant losses worldwide. As pathogens become resistant to synthetic fungicides microbial antagonists are promising alternatives, but only one postharvest biocontrol agent has been registered for use in Canada. Plant root-associated rhizobacteria adapted to cold climates may be a potential source of novel biocontrol agents. Four rhizobacteria that were isolated from legumes grown in Saskatchewan soils and suppressed the growth of three major postharvest pathogens of pome fruit, *Penicillium expansum*, *Botrytis cinerea* and *Mucor piriformis* during cold storage were selected for further characterization. Three *Pseudomonas* isolates and one *Serratia* isolate grew well at temperatures from 1 to 28°C and at pH 5-7 and were able to utilize the major sugars, organic acids and amino acids found in apples. Cell-free extracts from one pseudomonad isolate inhibited growth of *Penicillium expansum*. This isolate consistently increased medium pH following growth on several media, a factor which may contribute to the suppression of fungal pathogens. These rhizobacteria demonstrate potential for control of fungal pathogens responsible for post-harvest decay of pome fruit.