

Title A novel method for selecting antagonists against postharvest fruit decays originating from latent infections

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Citation Biological Control, Volume 59, Issue 3, December 2011, Pages 384-389

Keywords Postharvest diseases; Appressoria; Brown rot

Abstract

Biological control of fruit decays originating from wound infections after harvest has made great progress during the past two decades and several products are commercially available. However, this is not the case for postharvest decays originating from latent infections which occur in the orchard. This is mainly due to the lack of methodology used to screen and evaluate microbes for biocontrol activity against this type of infection. We hypothesized that biological control of latent infections occurs in nature on fruit and that microorganisms involved could be isolated from the fruit and used for control of this type of infection after harvest. We found that direct interactions between the pathogen structure involved in latent infection (appressorium) and the test microorganism can be studied *in vitro* and then tested *in situ* on fruit. Appressoria of the brown rot pathogen, *Monilinia fructicola*, were produced on parafilm or wax membranes after depositing drops containing conidia in a 0.25 mM sucrose solution containing 10 mM cAMP and incubating at 18 °C for 16 h. This was followed by the addition of the test organism, additional incubation at 24 °C for 72 h, and microscopic observations. Microorganisms colonizing appressoria and mycelium were further tested for biocontrol activity on fruit containing latent infections induced artificially under laboratory conditions. Among 904 microorganisms tested, using this approach, we found several effective antagonists against brown rot originating from latent infections on stone fruits. The next step is to select those antagonists that are best adapted to conditions occurring during storage and handling of the fruit. This approach may also be adapted to develop biocontrol of latent infections in other fruit/pathogen systems.