

Title Biological control of postharvest green mold decay of oranges by *Rhodotorula glutinis*
Author Xiao Dong Zheng, Hong Yin Zhang and Ping Sun
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Abstract

The biocontrol activity of *Rhodotorula glutinis* on green mold decay of oranges caused by *Penicillium digitatum* was investigated in vitro and in vivo. Significant control was achieved with a washed cell suspension and an unwashed cell culture mixture of *R. glutinis*. Treatment of wounds with autoclaved cell cultures or cell-free culture filtrate did not prevent decay. The protection provided by the washed yeast cells was dose-dependent. The higher the concentration of *R. glutinis*, the better the effect of the biocontrol capacity. At concentrations of yeast of 1×10^9 colony-forming units per milliliter or higher and pathogen spore suspensions of 5×10^4 spores per milliliter, green mold was almost inhibited after 4-days incubation at 20 °C. The interval between the pathogen inoculation and the antagonist application significantly influenced the biocontrol ability. The biocontrol efficacy of *R. glutinis* applied before the pathogen was better than that of applied after the pathogen. Surprisingly, *R. glutinis* was also effective in controlling green mold at low temperature (4 °C). Rapid colonization of the yeast in wounds was observed during the first 3 days at 20 °C, and remained stable after 5-days incubation. On fruits stored at 4 °C, even after 21 days, the population of *R. glutinis* in wounded fruits was more than 1,600-fold of what it was just prior to storage. In the test on potato dextrose agar plates, agar disks of *R. glutinis* nutrient yeast dextrose agar cultures placed on PDA plates seeded with pathogens did not inhibit the growth of *P. digitatum*. Spore germination of pathogens in potato dextrose broth was greatly controlled in the presence of living cell suspensions.