

**Title** Control of postharvest pear diseases using *Rhodotorula glutinis* and its effects on postharvest quality parameters

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### Abstract

*Rhodotorula glutinis* was evaluated for its activity in reducing postharvest gray mold decay and blue mold decay of pear caused by *Botrytis cinerea* and *Penicillium expansum* respectively, and in reducing natural decay development of pear fruits, as well as its effects on postharvest quality of fruits. There was a significant negative correlation between concentrations of the yeast cells and infectivity of the pathogens. At concentrations of *R. glutinis* at  $5 \times 10^8$  CFU/ml, the gray mold decay was completely inhibited after 7 days incubation at 20 °C, while the control fruit had 100% disease incidence and 2.15 cm lesion diameter respectively, at challenged with *B. cinerea* spores suspension of  $1 \times 10^5$  spores/ml; No completely control was got to blue mold, when pear fruits stored at 20 °C for 7 d (challenged with *P. expansum* spores suspension of  $5 \times 10^4$  spores/ml), but the decay was distinctly prevented with 20% and 0.60 cm of disease incidence and lesion diameter respectively, while the control fruits were 100% and 2.74 cm, respectively.

Rapid colonization of the yeast in wounds was observed during the first 1 d at 20 °C, and then the populations stabilized for the remaining storage period. On pear wounds kept at 4 °C, rapid colonization of the yeast in wounds was observed during the first 3 d, and then the increase in population density of *R. glutinis* turned slow, which continued over 6 d after application of the antagonist until it reached a high level. Then, the populations stabilized for the remaining storage period. In the test on PDA plates, *R. glutinis* significantly inhibit the growth of *B. cinerea* and *P. expansum*. Spore germination of pathogens in PDB was greatly controlled in the present of living yeast cell suspensions.

*R. glutinis* significantly reduced the natural development of decay of pear following storage at 20 °C for 7 days or at 4 °C for 30 days followed by 20 °C for 5 days, and did not impair quality parameters, including mass loss, firmness, TSS, ascorbic acid or titratable acidity. Thus, the application of *R. glutinis* can be an alternative to chemicals for control of postharvest diseases on pear fruits.