

Title Control of *Penicillium Expansum* and *Botrytis Cinerea* on Apple Fruit by Mixtures of Bacteria and Yeast

Author Juan Calvo, Viviana Calvente, María E. Orellano, Delia Benuzzi and Maria I. Sanz

Citation Food and Bioprocess Technology, 3, Number 5, 644-650, 2010

Keywords Biocontrol; *Botrytis cinerea*; *Penicillium expansum*; *Cryptococcus laurentii*; *Rhodotorula glutinis*; *Rhanelia aquatilis*; Postharvest diseases; Apple

Abstract

Antagonistic activity of the mixtures *Rhanelia aquatilis*–*Rhodotorula glutinis* and *R. aquatilis*–*Cryptococcus laurentii* was assessed against *Penicillium expansum* (cause of blue rot) and *Botrytis cinerea* (cause of grey rot) on apple fruit at 4 °C and 95% relative humidity (RH). Under these cold-storage conditions, the mixture *R. aquatilis*–*R. glutinis* inhibited the development of *B. cinerea* and *P. expansum* in apples stored for 40 days and reduced the incidence of disease produced by these moulds to nearly zero. The other mixture, *R. aquatilis* – *C. laurentii*, was less effective; the incidences of the grey rot and the blue rot were about 25% and 15%, respectively. Population dynamics of the mixtures showed that the growth of *R. aquatilis* was strongly stimulated by the presence of the yeast *R. glutinis*, but in the case of the mixture *R. aquatilis* – *C. laurentii*, the same effect could not be observed. In this study, it was demonstrated that the combination of two microorganisms with different requirements and antagonistic abilities resulted in a successful mixture against the two pathogen molds, *B. cinerea* and *P. expansum*. In addition, it was also proved that it is possible to improve the biocontrol of these pathogens without increasing the inoculum size of the antagonist (alone or in mixtures), which was always 10^6 cell/ml, despite the high concentration of the pathogen (10^6 conidia/ml) utilized.

<http://www.springerlink.com/content/k80355v226k47545/fulltext.pdf>