

Title Assessment of *Pichia anomala* (strain K) efficacy against blue mould of apples when applied pre- or post-harvest under laboratory conditions and in orchard trials

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Abstract

The yeast *Pichia anomala* strain K was selected in Belgium from the apple surface for its antagonistic activity against post-harvest diseases of apples. The efficacy of this strain against *P. expansum* was evaluated in the laboratory in three scenarios designed to mimic practical conditions, with different periods of incubation between biological treatment, wounding of fruit surface, and pathogen inoculation. Higher protection levels and higher final yeast densities were obtained when the applied initial concentration was 1×10^8 cfu ml⁻¹ than when it was only 1×10^5 cfu ml⁻¹. The protection level correlated positively with the yeast density determined in wounds and was influenced by apple surface wetness. In orchard trials spanning two successive years, biological treatment against *P. expansum*, based on a powder of *P. anomala* strain K (1×10^7 cfu ml⁻¹), β -1,3-glucans (YGT 2 g l⁻¹), and CaCl₂·2H₂O (20 g l⁻¹), was applied to apples pre- or post-harvest under practical conditions and its effect compared with standard chemical treatments. The first year, the highest reduction (95.2%) against blue decay was obtained by means of four successive fungicide treatments and the next-highest level (87.6%) with pre-harvest high-volume spraying of the three-component mixture 12 days before harvest. The second year, the best results were obtained with post-harvest Sumico (carbendazim 25% and diethofencarb 25%) treatment and post-harvest biological treatment, both by dipping the apples, 88.3 and 56.3% respectively. A density threshold of 1×10^4 cfu cm⁻² of strain K on the apple surface seemed to be required just after harvest for high protective activity, whatever the method and time of application. In the case of pre-harvest biological treatments, variations in meteorological conditions between the 2 years may have considerably affected strain K population density and its efficacies.

<http://www.springerlink.com/content/y5675424p022w362/fulltext.pdf>