

Title *Candida sake* and *Pantoea agglomerans* as biocontrol agents against patulin production in stored apples

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Abstract

Patulin, a mycotoxin produced primarily by *Penicillium expansum*, is currently of great concern because of its undesirable effects on human health. It has been proved that patulin can damage organs and tissues in animals and some studies revealed carcinogenic and teratogenic effects. Patulin is found mainly in low quality apples diverted to production of apple by-products. The use of chemicals is the most common procedure to prevent postharvest rots but legislation is becoming more and more restrictive. The use of biocontrol agents (BCAs) as an alternative is currently being proposed. The aim of this study was to evaluate the effect of two BCAs (*Candida sake* CPA-2 and *Pantoea agglomerans* CPA-1) on *P. expansum* growth and patulin accumulation in cold storage and further deck storage. Wounded apples were inoculated with a cell suspension of either *C. sake* or *P. agglomerans* and with a *P. expansum* conidial suspension. Apples were cold stored at 1°C until lesion diameter reached 2 or 4 cm. Half the apples of each treatment were further stored at 20°C for three days before patulin analyses. The BCAs were found to control blue rot and patulin accumulation during cold storage. *C. sake*, however, seemed to be more efficient than *P. agglomerans*. Subsequent storage at room temperature should be avoided as the controlling effect of BCAs under cold storage weakens due to the accelerated development of rot during deck storage. The authors are grateful to the Spanish government (MEC, project AGL2004- 07549-C05-01) for funding.