

Title Patulin accumulation in apples during postharvest: Effect of controlled atmosphere storage and fungicide treatments

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Abstract

The aim of this study was to assess the opportunities of *Penicillium expansum* to develop and produce patulin in apples under two different CA storage methods (LOW and U-LOW) at 1 °C. Differences in lesion diameter and patulin accumulation depending on CO₂ and O₂ partial pressure were studied. Further apple rot and patulin production during a three days post-storing stage at 20 °C was also monitored so that effect of further storage at room temperature could be assessed.

Two lots of apples of Golden variety with different ripeness degrees were used. Half of each lot was fungicide treated. Apples were inoculated with patulin producer *P. expansum* strains and stored at 1 °C for either two month or 2.5 months at both LOW and U-LOW conditions. The extent of lesions and patulin accumulation both at the end of CA cold storage and after three days at 20 °C were assessed. CA storage conditions had strong significance in *P. expansum* growth on apples and factors such as fruit ripeness, fungicide treatment and time at the storage room had significant influence. In general, bigger lesions were observed under U-LOW than under LOW conditions, lesions being similar or bigger when increasing the storage time from 2 to 2.5 months. *P. expansum* grew faster in riper apples, although fungicide application was clearly more effective for ripe rather than for underripe apples. Although lesions were evident after both storage conditions, no patulin was detected. Increase of lesion when fruits were subsequently stored at 20 °C was evident in all cases and patulin was detected at this moment. No differences in patulin content were found at this stage between LOW and U-LOW stored apples.