Title Effects of pure oxygen treatment on fruit decay and defense enzyme activities in harvested Chinese bayberry fruit

Author Y.H. Zheng, Z.F. Yang, S.F. Cao, N. Li and S.J. Ma

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Abstract

Chinese bayberry fruit were stored either in air (control) or pure oxygen for up to 12 days at 5°C to investigate the effects of high oxygen on fruit decay control and its relation to the induction of defense enzyme activities. The results indicated that exposure to pure oxygen significantly prevented fruit decay. At the end of the storage period, the decay rate of fruit exposed to pure oxygen was only 17% while that of control fruit reached 54%. Pure oxygen induced a significant increase in chitinase and β-1,3-glucanase activities which reached peak values at day 6 of storage. Phenylalanine ammonia-lyase and peroxidase activities as well as total phenolic content were also increased by exposure to pure oxygen, and maintained at significantly higher levels compared with the control fruit throughout the storage period. These results suggest that the inhibitory effect of high oxygen on decay incidence was correlated with the induction of defense enzyme activities. The induced disease resistance enzymes may be involved in the mechanisms by which high oxygen inhibits fruit decay in Chinese bayberry fruit.