

High oxygen atmospheric packaging (HOAP) reduces H₂O₂ production by regulating the accumulation of oxidative stress-related proteins in Chinese flowering cabbage

Ling Wang, Ming Wen, Feiping Chen, Zheng Luo, Juan Yin, Yulong Chen and Hua Huang

Postharvest Biology and Technology, Volume 165, July 2020, 111183

Abstract

In this study, the impact of high oxygen atmospheric packaging (HOAP) on hydrogen peroxide (H₂O₂) production, and on the content of hemicellulose, cellulose, lignin, and protein accumulation in Chinese flowering cabbage (*Brassica campestris* L. ssp. *chinensis* Makino) was assessed by using air packages as a control. The results showed that HOAP efficiently reduced the H₂O₂ levels in the stem of Chinese flowering cabbage during the storage process. An increase in tissue firmness, and significant reduction in the content of hemicellulose, cellulose, and lignin in the stem were observed upon HOAP treatment. The activities of peroxidases (POD) and laccases were also suppressed. Furthermore, proteomic profiling revealed a total of 63 differentially expressed proteins, of which oxidative stress-related proteins (enzymes) were found to be the major proteins that were regulated by HOAP treatment. The reduction in hemicellulose, cellulose, and lignin biosynthesis regulated by H₂O₂ signal was probably related to the differential accumulation of oxidative stress-related proteins that were induced by the HOAP treatment.