

Title Changes in ascorbic acid content and ascorbate metabolism-related enzyme activities during storage in cucumber (*Cucumis sativus* L.) and balsam pear (*Momordica charantia* L.)

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### Abstract

Investigating the trends of ascorbic acid reduction in fruits at low temperature storage would importantly elucidate the reasons for occurrence of chilling injury (CI) physiological disorder. Cucurbita fruits stored at 5, 10, and 20°C were analyzed for ascorbic acid (ASA) content, and activities of ascorbate oxidase (AOX), ascorbate peroxidase (APX), and monodehydro ascorbate reductase (MDR). CI was observed in cucumber fruits at 5°C, as well as in balsam pear fruits at 5 and 10°C. The cucumber fruits at 10°C also developed core browning. ASA content decreased in cucumbers but remained constant in balsam pears when the fruits were stored at 5 and 10°C. However, it quickly declined in balsam pear fruits stored at 20°C. Similar trends of initial increase followed by a rapid decrease of AOX activities were observed in all storage treatments for cucumber. APX activity in cucumbers at 5°C remained stable until day 5, but initially increased until day 3 for those stored at 10 and 20°C then followed by a decline. Additionally, the MDR activity in cucumbers at 5°C increased only until day 5, but initially increased on the first day then gradually declined for those stored at 10 and 20°C. Meanwhile, it increased again at day 3 for cucumbers stored at 10°C while reaching higher levels than any other treatments. In balsam pears, MDR was the only enzyme related to ASA metabolism. The changes in ASA contents and enzyme activities were different between cucumber and balsam pear fruits although they belong to the same family and having similar CI sensitivity.