

Title Effects of postharvest ethanol vapor treatment on maintenance of ascorbic acid in broccoli florets

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Abstract

Ascorbic acid is an essential element for human life, and also plays an important role in plant metabolism. It provides significant biochemical functions as an antioxidant compound, an enzyme co-factor, and a donor and acceptor of electrons in the transport system. Moreover, it acts as a defense against oxidative stress. A simple and cost-effective ethanol vapor treatment using alcohol powder was conducted to clarify the effects on maintenance of ascorbic acid in broccoli (*Brassica oleracea* L var. *italica*) florets. Fresh broccoli harvested in Tottori Prefecture was used in this study. Five branchlets excised from broccoli heads were placed in perforated polyethylene bags with 3 g of alcohol powder and stored at 20°C in darkness. Untreated broccoli florets started to turn yellow after 2 days in storage (DIS) and turned completely yellow at 4 DIS. Broccoli florets treated with alcohol powder turned slightly yellow at 5 DIS. Ascorbic acid content in florets with or without treatment decreased during storage, but the rate of decrease in untreated broccoli florets was faster than that in treated florets. In treated broccoli florets, both ascorbate peroxidase (APX) and dehydroascorbate reductase (DHAR) activities were maintained, whereas in untreated broccoli florets APX and DHAR decreased considerably during storage. Glutathione reductase (GR) activity in treated florets was slightly higher than that in untreated broccoli during storage. Treatment of broccoli florets with alcohol powder seemed to be effective for maintenance of ascorbic acid because APX, GR and DHAR activities in treated broccoli florets were higher than those in untreated ones.