

Abstract

A simple and cost-effective ethanol vapor treatment using alcohol powder, which gradually diffuses ethanol vapor, was conducted to inhibit the senescence of harvested broccoli (*Brassica oleracea* L. var. *Italica*) and to clarify the mechanism for the maintenance of the green color in the florets. Six branchlets were placed in a polyethylene bag with 0, 3, 6, or 12 g of alcohol powder and stored at 20 °C in darkness. The untreated broccoli florets started to turn yellow at 3 days in storage (DIS). The broccoli florets treated with 3 and 6 g of alcohol powder finally turned slightly yellow at 5 DIS. The yellowing was inhibited with 12 g of alcohol powder over a 5-day storage period. Ethylene production of untreated broccoli was highest at 2 and 3 DIS; after that, it decreased. However, in broccoli treated with alcohol powder, ethylene did not increase. 1-Aminocyclopropane-1-carboxylic acid (ACC) contents in untreated broccoli florets increased gradually, whereas in those treated with alcohol powder contents increased dramatically at 4 DIS. ACC oxidase activity in untreated broccoli florets also increased at 2 and 3 DIS, at the same time as the increase in ethylene production. There was no increase in those treated with alcohol powder. These results revealed that treatment with alcohol powder was effective for prolonging the shelf life of broccoli because it suppressed ethylene production by inhibiting ACC oxidase activity.