Title Impact of UV-B irradiation on chlorophyll degradation and chlorophyll-degrading enzyme activities in stored broccoli (*Brassica oleracea* L. Italica Group) florets

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Citation Food Chemistry, Volume 120, Issue 3, 1 June 2010, Pages 645-651

Keywords Broccoli; UV-B; Chl degradation; Chl derivatives; Chl-degrading enzymes

Abstract

UV-B irradiation was applied to broccoli florets to investigate its effect on chlorophyll degradation and chlorophyll-degrading enzyme activities in stored broccoli. Broccoli florets were irradiated with UV-B doses at 4.4, 8.8, and 13.1 kJ m^{-2} and then kept at 15 °C in darkness. We found that a UV-B dose of at least 8.8 kJ m^{-2} efficiently delayed the decrease of the hue angle value and the contents of chlorophylls a and b. Chlorophyllide a and 132-hydroxychlorohyll a gradually decreased with senescence. Pheophorbide a and pyropheophorbide a levels were significantly higher in broccoli without UV-B treatment. Chlorophyllase and chlorophyll-degrading peroxidase activities with UV-B treatment were suppressed, as well as the activity of Mg-dechelatase. Mg-dechelating substance activity was also suppressed with this treatment. We concluded that UV-B treatment effectively suppressed chlorophyll degradation in broccoli florets during storage, suggesting that the effect could be due to the suppression of chlorophyll-degrading enzyme activities.