Title Effect of UV-A and UV-B irradiation on broccoli (*Brassica oleracea* L. italica Group) floret yellowing during storage

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Abstract

UV-A or UV-B irradiation was applied to broccoli florets to investigate the effect on floret yellowing. Florets were irradiated with two UV-A doses (4.5 and 9.0 kJ m^{-2}) and five UV-B doses (4.4, 8.8, 13.1, 17.5, and 26.3 kJ m^{-2}) and then kept in darkness at 15 °C. In general, broccoli florets retained more color after UV-B irradiation than after UV-A. UV-B doses of at least 8.8 kJ m^{-2} resulted in surface color with a higher hue angle, as compared to those treated with 4.4 kJ m^{-2} UV-B or without UV-B. We therefore selected a UV-B dose of 8.8 kJ m^{-2} for application to different broccoli cultivars ('Pixel' and 'Sawayutaka'), harvested during the winter and early summer seasons. During storage, the 'Sawayutaka' cultivar exhibited a slower decrease in green color of florets, when compared to the 'Pixel' cultivar. UV-B treatment delayed floret yellowing and chlorophyll degradation. Broccoli harvested in winter or early summer and irradiated with UV-B during storage at 15 °C had higher a chlorophyll content and hue angle value than broccoli without UV-B treatment. These results suggest that UV-B irradiation is effective in retaining the green color of florets during storage.