

Title Involvement of chlorophyllase on chlorophyll degradation in stored broccoli florets and its control by UV treatment

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Abstract

Yellowing is the most visible deterioration in broccoli (*Brassica oleracea* L. Italica Group) that usually occurs with the progress of chlorophyll (Chl) degradation. This study deals with the control of floret yellowing in stored broccoli by using UV-B irradiation at 0 (control) and 8.8 kJ.m⁻². The application of UV-B at 8.8 kJ.m⁻² effectively delayed yellowing of broccoli florets. Chl a derivatives including chlorophyllide (Chlide) a, C13²-hydroxychlorophyll (C13²-OHChl) a and pheophytin (Phy) a levels in broccoli florets were decreased concomitantly with the enhancement of pheophorbide (Pheide) a and pyropheophorbide (Pyropheide) a levels especially in the control treatment. On the other hand, Child a, C13²-OHChl a and Phy a levels were increased in 8.8 kJ.m⁻² UV-B treated broccoli during storage at 15°C. Two types of chlorophyllase (Chlase) were identified by molecular exclusion chromatography. Type I was suppressed in UV-B treated broccoli on day 4, and the *K*_m value of Type I was lower than that of Type II. Thus, the Chlase activity, especially Type I, was effectively suppressed by UV-B treatment, whereas Type II Chlase may take in part of Chl degradation in stored broccoli florets.