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 (Chi) 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. Chi a derivatives including chlorophyllide (Chlide) *a,* C13^{2}-hydroxychlorophyll (C13^{2}-OHChl) a and pheophytin (Phy) a levels in broccoli florets were decreased concomitantly with the enhancement of pheophorbide (Pheide) a and pyropheoqhorbide (Pyropheide) a levels especially in the contro1 treatment. On the other hand, Chlide *a,* C13^{2} -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 Km 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 Chi degradation in stored broccoli florets.