

Title Effect of leaf maturity on chilling injury sensitivity of ready-to-cook sweet basil (*Ocimum basilicum* L.)

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Citation ISHS Acta Horticulturae 746:351-356. 2007.

Keywords sweet basil; ready-to-cook; chilling injury; chlorophyll fluorescence

Abstract

In order to compare the sensitivity to chilling injury (CI), sweet basil (*Ocimum basilicum* L.) leaves were divided into young and mature leaves then stored at 4 and 10°C. CI was developed on leaves held 4°C while leaves kept at 10°C developed no injury. Mature leaves developed a greater severity of CI symptoms compared with young leaves and also had higher levels of polyphenol oxidase (PPO) and lipoxygenase (LOX) activities which resulted in an increase in malondialdehyde (MDA) content compared with young leaves. In addition, chlorophyll fluorescence analysis by pulse-amplitude modulation (PAM) measurement was performed to determine CI in stored sweet basil leaves. Changes in chlorophyll fluorescence (F_v/F_m), the photochemical quenching coefficient (qP) and the non-photochemical quenching coefficient (qNP) were found to be highly correlated with CI development. The results suggest that LOX and MDA might be associated with initiation of CI through involvement in membrane deterioration. In addition, chlorophyll fluorescence measurements are suitable as a rapid non-destructive method for estimation of chilling stress in chlorophyll-containing plant tissue.