

Title The relationship between chilling injury and membrane damage in lemon basil (*Ocimum × citriodourum*) leaves

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Abstract

Leaves of lemon basil (*Ocimum × citriodourum*) were stored in sealed polyethylene bags at 4 °C and 12 °C. At 4 °C, leaf browning, the visible symptom of chilling injury, occurred earlier and was more severe in mature leaves than in young leaves. No positive correlation was found, when comparing young and mature leaves stored at 4 °C, between browning and either substrate levels (free phenolics) or the activities of peroxidase or catechol oxidase, which might catalyse these reactions. The levels of saturated and unsaturated fatty acids differed only slightly and were not correlated with chilling injury. Compared to young leaves, mature ones showed higher lipoxygenase activity throughout the period of low temperature storage. This might indicate more degradation of membrane unsaturated fatty acids. In addition, mature leaves exhibited lower catalase activity than young ones. This suggests lower protection against membrane oxidation in mature leaves. The data thus suggest a correlation between lipoxygenase activity, antioxidant defense, and chilling injury.