

Molecular and physiological analyses of the effects of red and blue LED light irradiation on postharvest senescence of pak choi

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Abstract

Pak choi (*Brassica rapa* ssp. *chinensis*) is a popular, yet highly perishable, leafy vegetable that is conventionally stored in the dark or shade. In this study, we analyzed the effects of light quality, light intensity, and irradiation duration on its postharvest senescence at 20 °C. Red light most strongly inhibited its senescence as shown by slower loss of photochemical efficiency (Fv/Fm ratio) and higher contents of chlorophyll, vitamin C, and total soluble proteins, while blue light had a much weaker effect. Red light inhibited the expression of putative chlorophyll degradation and senescence-associated genes, while promoting the expression of putative vitamin C biosynthetic genes. A daily irradiation of red light ($35 \mu\text{M m}^{-2} \text{s}^{-1}$) for eight hours is optimal for delaying the senescence of its leaves. In contrast, far-red light treatment promoted its leaf senescence, indicating that phytochrome signaling is likely involved in the regulation of the postharvest senescence of pak choi.