Combination method of UV-B and UV-C prevents post-harvest decay and improves organoleptic quality of peach fruit

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Abstract

Rapid ripening and post-harvest decay are the most limiting factors that affect the storage life of peach fruit. Postharvest UV exposure is a relatively new method that can induce positive biological effects, such as reducing decay rate and prolonging the storage period in fruit. The single and combined effects of ultraviolent radiations (UV-B and UV-C) treatments with different intensities (0.36 and 0.72 kJ m^{-2}) and duration (10 and 20 min) were studied on the weight loss, vitamin C, decay, total soluble solids (TSS), texture firmness, total phenolic compounds (TPC), titratable acidity, and sensory properties of peach fruits during 25 days at 4 °C. Compared with control group, UV treatments (UV-B, UV-C, UV-B + UV-C) showed significant positive effects on peach fruits after long-term storage ($P < 0.001$). UV-C treatment compared to UV-B treatment improved physicochemical and sensory properties throughout storage ($P < 0.001$). Overall, UV-C + UV-B treatment (28.8 kJ m^{-2}) showed the best results compared to control, and peach weight loss, decay, and TSS decreased by 22.1, 290 and 10%, respectively, and vitamin C, firmness, TPC, titratable acidity, pH, increased by 34.78, 22.82, 4.7, 92.85, 17.77%, respectively. Furthermore, we obtained the desired values of sensory properties with the above treatment. It seems UV-C + UV-B treatment because of keeping the quality and shelf life can be considered as a high-performance pre-treatment method for long-term keeping of peach fruit.