Postharvest irradiation as a quarantine treatment and its effects on the physicochemical and sensory qualities of Korean citrus fruits

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Scientia Horticulturae 236: 265-271. (2018)

Abstract

Two Korean citrus fruits, *Jinjihyang* and *Chunggyun,* were exposed to gamma irradiation at 0, 0.4 and 1 kGy as an ionizing quarantine treatment and were then subjected to evaluations of physicochemical and sensory quality attributes during storage at 4 ± 1 °C for 0, 10 and 20 days. Upon irradiation at 1 kGy, the narinrutin content of *Jinjihyang* significantly decreased (109.64–94.80 mg/100 g), while hesperidin content remained stable. However, both flavonoids decreased significantly during storage in both fruit varieties. Vitamin C was stable after irradiation but a significant decrease (42.97–27.21 mg/100 mL) was observed in 1 kGy-irradiated sample at the 20th day of storage. Brix, organic acids, and sensory properties of both fruits were not affected by irradiation or storage. The 1 kGy-treated fruits showed the highest titratable acidity (%) but this was not reflected in the sensory scores, even though *Jinjihyang* was more susceptible to irradiation than *Chunggyun*. Overall, irradiation at less than 1 kGy shows a potential to be used as a postharvest quarantine treatment for Korean citrus fruits.