

Title Effects of X-irradiation on scoparone levels in 'Clemenules' Clementine Mandarin flavedo
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Abstract

Phytoalexins are frequently produced in infected tissues of plants. It has been demonstrated that phytoalexins such as scoparone (6,7-dimethoxycoumarine) play an important role in the resistance of citrus fruit against fungal pathogens. Effects of X-ray irradiation (at doses of 510 and 875 Gy) on scoparone level in 'Clemenules' Clementine rind were evaluated in this study. After irradiation, half of mandarins were stored at 20°C for 7 or 14 days and the other half were stored at 5°C and 90% RH for 1 or 2 months. For each storage condition, there was a control mandarin group that was not irradiated, a group treated at 510 Gy and another group treated at 875 Gy. Following these treatments, the level of scoparone accumulated in the flavedo tissue was determined by HPLC analysis using a fluorescence detector. X-irradiation at 510 Gy followed by storage at 20°C during 14 days was the most effective treatment in stimulation the phytoalexin induced by this combination reached 1 ppm (1µg/g dry mandarin flavedo), twenty times higher than that in the flavedo of nonirradiated clementines kept in the same storage conditions. Fruit irradiated at the dose of 875 Gy and stored at 20°C during 7 days presented 0.7 ppm of scoparone. The levels of scoparone in clementines stored for 1 or 2 months at 5°C were very low.