Title Physiological basis of UV-C induced resistance to *Botrytis cinerea* in tomato fruit II. Modification of fruit surface and changes in fungal colonization

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Citation Postharvest Biology and Technology, Volume 47, Issue 1, January 2008, Pages 21-26

Keywords Cuticular wax; Gray mold; UV-light; Hormesis; *Lycopersicon esculentum*; Postharvest; Pre-storage treatment; Scanning electron microscopy

Abstract

Effect of pre-storage treatment with hormic dose of UV-light and ripening on the changes in topography and fine structure of postharvest tomato fruit during storage was studied by scanning electron microscopy (SEM). Both ripening and UV-treatment induced significant structural modifications in tomato fruit surface. Flattening of cellular mounds associated with normal ripening process was more intense with UV-treatment, and the fruit surface was also more wrinkled with treatment. The formation of an operculum over broken trichomes was a common feature of ripened control fruit, while this structure was incompletely formed in the treated fruit. Surface of senescent control fruit was characterized by the presence of an amorphous epicuticular wax, which was quasi-absent on UV-treated fruit. Surface colonization of UV-treated fruit by *Botrytis cinerea* was also different from untreated control. Colonization was sparse on the treated fruit, although direct cuticle penetration as well as penetration through damaged trichomes was observed in both cases. Fewer adhesion structures (appressoria) were observed on UV-treated fruit than on non-irradiated control, suggesting that structural modification of the epicuticular wax induced by UV may be a factor affecting the ability of *B. cinerea* to attach to the treated fruit surface. This study shows that UV-treatment causes alteration in the amount of epicuticular wax and its ultrastructural arrangement, presumably due to changes in its chemical composition. These changes could affect light reflectance characteristics of the fruit surface, and possibly increase transpiration loss leading to changes in fruit appearance. Another consequence of UV-induced physical and chemical modifications of tomato fruit surface could be an improved ability of the tissue to resist infection by *B. cinerea*. However, the reduced colonization of the UV-treated fruit by the pathogen cannot be attributed solely to changes in surface topography.