Title Physiological basis of UV-C induced resistance to *Botrytis cinerea* in tomato fruit III. Ultrastructural modifications and their impact on fungal colonization

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Citation Postharvest Biology and Technology, Volume 47, Issue 1, January 2008, Pages 27-40

Keywords Cell wall stacking zone (CWSZ); Cytochemical labeling; Gray mold; *Lycopersicon esculentum*; UV light; Hormesis; Host defense mechanisms; HR-like cell death; Physical barriers; Biochemical barriers; Postharvest; Pre-storage treatment; Transmission electron microscopy

Abstract

Treatment of postharvest tomato fruit with the hormic dose (3.7 kJ/m^2) of UV-C, a dose shown optimal for inducing decay resistance, caused ultrastructural modifications of the pericarp. UV induced plasmolysis of the epicarp cells as well as some cell layers of the mesocarp. Collapse of these cells, resembling HR-like cell death, led to the formation of the cell wall stacking zone (CWSZ). Inoculation of untreated fruit with *Botrytis cinerea* resulted in rapid tissue colonization and maceration. In UV-treated fruit, fungal development was mainly restricted to the outer most part of the fruit and progression of the fungus toward the inner tissues appeared to have been hindered by the CWSZ. Cytochemical labeling for cellulose and pectin revealed that the CWSZ was less prone to degradation by cell-wall degrading enzymes secreted by the fungus. The apposition of a paramural deposit in the CWSZ upon UV treatment increased further after inoculation. The resistance of the cell wall to degradation and the increased paramural deposit points to biochemical reinforcement of the CWSZ. It is concluded that the CWSZ, through physical impedance of pathogen expansion, was of paramount importance in UV-induced resistance against *B. cinerea* in postharvest tomato fruit.