

UV-C treatment controls brown rot in postharvest nectarine by regulating ROS metabolism and anthocyanin synthesis

Wanli Zhang, Haitao Jiang, Jiankang Cao and Weibo Jiang

Postharvest Biology and Technology, Volume 180, October 2021, 111613

Abstract

UV-C is a no residual environmentally friendly physical treatment that could activate the fruit defense system and induce resistance to control the postharvest disease. Herein, the study was performed to investigate the effect of UV-C on disease occurrence, antioxidant system, disease-resistant defense enzymes, and phenylpropane metabolic pathway, and anthocyanin biosynthesis in nectarine fruit inoculated with *Rhizopus stolonifer*. Compared with the fruit without treatment, the results showed 3kJ m⁻² UV-C treatment decreased lesion diameter as well as disease index. UV-C treatment increased the activities of antioxidant enzymes including superoxide dismutase (SOD), catalase (CAT), and ascorbate peroxidase (APX) and the contents of ascorbic acid (ASA) as well as glutathione (GSH). UV-C treatment activated the phenylpropane metabolic pathway and anthocyanin biosynthesis, thereby increasing the content of phenolic compounds, total flavonoids, anthocyanins, and lignin. Besides, UV-C treatment also promoted the activities of chitinase (CHI) and β -1,3-glucanase (GLU). These data demonstrated that UV-C treatment could promote the antioxidant system, stimulate phenylpropane metabolic pathway and anthocyanin biosynthesis, thus alleviate disease severity in *R. stolonifer*-inoculated nectarine during storage. This work concluded that UV-C was an eco-friendly treatment to control disease occurrence of postharvest nectarine fruit.