

Title Effectiveness of UV-C irradiation on growth of post-inoculated *Listeria monocytogenes* on fresh-cut broccoli

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Abstract

Ultraviolet (UV) light irradiation has demonstrated positive effects as a postharvest treatment in prolonging the storage life of fresh produce and as a non thermal method of inactivation of pathogenic microorganisms. The objective of this research is to study the effectiveness of UV-C light irradiation as a postharvest treatment on the subsequent attachment and growth of human pathogens on fresh produce. Fresh-cut broccoli is highly perishable and susceptible to deterioration and contamination by pathogenic microorganisms after harvest. Fresh-cut broccoli branchlets were treated with UV-C doses of 2.5 and 5 kJ/m² and inoculated with *Listeria monocytogenes* at various times (0 h, 6 and 24 h) after treatment. Growth of the bacteria on UV -C treated surfaces of broccoli branchlets was evaluated by extracting and enumerating the microorganisms on day 3,4, 6, and 8 after treatment. Results of the study show UV-C irradiation at a dose of 5 kJ/m² was able to restrict the growth of *L. monocytogenes* in the samples inoculated 24 h post treatment, with no significant differences in colour and weight loss of the broccoli compared to the control treatments. These results imply UV -C treatment may be effective not just in controlling pre-existing pathogens but also reducing the risk of postharvest contamination. Previous studies have suggested that mild stress produced by UV -C light irradiation stimulates the synthesis of defence related phytochemicals in broccoli (such as glucosinolates) which also offer a variety of health benefits. It is not yet clear whether this mechanism is also responsible for the restriction of *L. monocytogenes* attachment and growth after UV -C irradiation.