Title Low UV-B application effects glucosinolates in nasturtium (*Tropaeolum Majus* L.)

Author Monika Schreiner, Angelika Krumbein, lnga Mewis, Christian Ulrichs, Susanne Huyskens-Keil Humboldt

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Abstract

In food processing, UV treatment is mainly used for disinfection or to delay product ripening. This study examined the feasibility of short-term and low UV-B application as emerging technology for enhancing health-promoting glucosinolates in freshly consumed *Tropaeolum majus* (nasturtium) plants. Plants subjected to UV radiation responed with an up-regulation of the plant's protective stress mechanisms. In addition to morphological changes, this protective stress response triggers distinct changes in the plant's secondary metabolism resulting in an accumulation of glucosinolates. Optimizing glucosinolate concentration by targeted postharvest UV-B applications will add health value and subsequently generate new opportunities for growers and processors by achieving the health-oriented food market. After harvest, different nasturtium organs (inflorescences, leaves and unripe seeds) were subjected to low UV-B levels (0.27 KJ m^{-2} d^{-1}) using a UV-B fluorescence light source (FL 20SE with an average fluency rate of 8.2 Ws m^{-2} measured at 305-310 nm). In addition, nasturtium inflorescences were packed in PLA trays and stored up to seven days (4°C, 90 RH). The results clearly demonstrated that the plant response to low UV-B exposure is organ-specific as in all organs benzyl glucosinolate accumulated to different extent. However, the elicitation effect is time limited. Benzyl glucosinolate concentration steadily decreased until the end of the storage period levelling down to the same concentration as for untreated control suggesting repetitive elicitor applications for a continuous triggering of the glucosinolate synthesis.