

**Title** Moderate UV-C pretreatment as a quality enhancement tool in fresh-cut Bimi<sup>®</sup> broccoli

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### Abstract

The effects of several UV-C pre-treatments (1.5, 4.5, 9.0 and 15 kJ m<sup>-2</sup>) on changes in physiological, sensory and microbial quality and health promoting bioactive compounds over 19 days at 5 and 10 °C of fresh-cut Bimi<sup>®</sup> broccoli were studied. Non-irradiated samples were used as controls. Bimi<sup>®</sup> broccoli (*Brassica oleracea* Italica Group × Alboglabra Group) is characterised by a long stem with a small floret with a mild and sweeter flavor than conventional varieties well adapted for fresh-cut purposes. Low and moderate UV-C doses (1.5 and 4.5 kJ m<sup>-2</sup>) had inhibitory effects on natural microflora growth. In relation to sensory quality, all treatments resulted in a shelf-life of 19 and 13 days at 5 and 10 °C respectively with the exception of 15 kJ UV-C m<sup>-2</sup> treated samples which resulted in a shorter shelf-life. These doses immediately increased total polyphenols contents up to 25% after 19 days at 5 °C compared to the initial value. All the hydroxycinnamoyl acid derivatives were immediately increased after UV-C treatments, with values 4.8- and 4.5-fold higher for 4.5 and 9.0 kJ UV-C m<sup>-2</sup> treated samples respectively over the control. Changes in phenolic compounds were highly influenced by the storage temperature throughout shelf-life. Total antioxidant activity generally followed the same pattern: the higher the UV-C doses, the higher total antioxidant capacity values. Generally, UV-C slightly reduced initial total chlorophyll content but delayed its degradation throughout shelf-life. It is concluded that a pre-treatment of 4.5 kJ UV-C m<sup>-2</sup> is useful as a technique to improve epiphytic microbial quality and health promoting bioactive compounds of fresh-cut Bimi<sup>®</sup> broccoli.