Spectral composition from led lighting during storage affects nutraceuticals and safety attributes of fresh-cut red chard (*Beta vulgaris*) and rocket (*Diplotaxis tenuifolia*) leaves

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Abstract

The main objective of this study was to evaluate the physiological and quality changes of fresh-cut red chard (*Beta vulgaris*) and rocket (*Diplotaxis tenuifolia*) leaves illuminated during storage with monochromatic light emitting diode (LED) lamps, featuring different spectral component (red, green, yellow, white, blue and far-red) and same light intensity (35 μmol m^{-2} s^{-1}). As control, storage in darkness was assayed. Biomass, colorimetric and microbiological changes were determined up to 10 d of storage at 5 °C. In addition, total antioxidant activity and bioactive compounds changes along the shelf-life were also monitored. Microbial counts were reduced by yellow and blue light in red chard, and by yellow and green light in rocket. Green and white light enabled to preserve colorimetric indexes and chlorophylls content mostly in rocket and, eventually, increasing carotenoids in red chard. Total antioxidant capacity and total phenols content were stimulated in response to red or blue light application for both species. On the other hand, LED light supply increased weight losses during storage as compared to darkness, although more limitedly in response to yellow and far red light. The study provides solid ground for further exploration on how LED lighting treatment during storage of red chard and rocket may foster product qualitative properties, suggesting that different spectral wavebands may alternatively enhance antioxidant properties and reduce microbiological risks.