

Development of modified atmosphere packages on the quality of Sicilian kale (*Brassica oleracea* var. *Acephala*) shoots

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Abstract

Since some decades, and also in the present global economic crisis, the request for fresh-cut products has showed an increasing trend, and its productive chain represent one of the most remunerative activity of agriculture. In this frame we pointed our attention to diversify fresh-cut vegetable items by several minor and/or underutilized crops and in some case by wild species gathered and utilized as vegetables in Sicily. Kale (*Brassica oleracea* var. *acephala*) shoots seem to be of great interest for fresh-cut production both for its environmental friendly growing techniques and nutraceutical properties, as it is rich in antioxidants compounds as ascorbic acid, total polyphenols, carotenoids and glucosinolates. The use of low level of oxygen (O₂) and of high level of carbon dioxide (CO₂) atmosphere appeared useful for maintain quality and extend shelf-life for several vegetables. In this condition the plant reduces respiration process that involves a complex biochemical reactions, delayed ripening and senescence and also reduces fungal development. Besides, refrigeration is important for elongate the shelf-life but modified atmosphere packaging (MAP) is an important complementary technique to apply. We studied a kale Sicilian type evaluating three modified atmospheres (air, 70% N₂:30% CO₂; 100% CO₂), three temperature levels (0, 4 and 8°C) during three storage times (0, 3 and 7 days). Every day, the percentages of oxygen and carbon dioxide, colour parameters (CIE L*, a* and b*) and dry weight of the shoots were monitored. Results showed the best shoots quality utilizing 70% N₂:30% CO₂ storage atmosphere at 4°C, the product is kept in good condition for all seven days. This study has improved knowledge about the respiration process and variation of color of kale shoots in relation to modified atmospheres packaging, temperature and time.