

Title High helium controlled atmosphere storage decreases microbial growth and preserves quality on fresh-cut mizuna baby leaves

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Abstract

The industrial sector of fresh-cut or minimally fresh processed products is very competitive and is forced to seek technological solutions in order to satisfy the consumer's demands, by offering new, safer, nutritious and high overall quality commodities. In recent years the market of oriental baby leaves, and among them mizuna (*Brassica rapa* var. nipposinica), has noticeably raised. However the scientific information about their postharvest behaviour is yet very scarce. The present work study the effect of two non conventional high helium controlled atmosphere (HeCA) storage versus air and a ultra low oxygen (ULO) atmospheres on natural microflora development and on changes in nutritional and sensory quality of fresh-cut mizuna baby leaves. The experiments were conducted throughout 8 days at 5°C. After harvest, the raw material was air pre-cooled at 5°C, pre-washed with tap water at 5°C and disinfected at 5°C with 100 ppm ClONa. Four different humidified atmospheres were assayed: 20.9 kPa O₂ + 0.03 kPa CO₂ + 79 kPa N₂ (control); 1 kPa O₂ + 20 kPa CO₂ + 79 kPa N₂; 83 kPa He + 15 kPa CO₂ + 2 kPa O₂; 98 kPa He + 2 kPa O₂. Both HeCA storage, independently of CO₂ content, decreased by 1 log cfu g⁻¹ the total aerobic mesophilic load after 8 days at 5°C while mizuna in air and conventional CA exceeded the maximum allowed by Spanish legislation. However the sensory quality was acceptable for consumption in all treatments. After shelf life no differences among treatments was found in total antioxidant capacity and phenolics content which kept their initial levels of 200 mg eq ascorbic acid kg⁻¹ fw and 27 mg eq chlorogenic acid 100 g⁻¹ fw respectively. As main conclusion, when compared to air or ULO atmospheres, HeCA storage for 8 days at 5°C, combined or not with moderate CO₂, improved final overall quality of fresh-cut mizuna baby leaves.