

EFFECT OF ACTIVE MODIFIED ATMOSPHERE PACKAGING USING CO₂ ON PHYSICOCHEMICAL PROPERTIES AND SENSORY QUALITY OF OLIVES (*OLEA EUROPAEA*)

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Introduction: Effects of modified atmosphere packaging on the physicochemical properties and sensory quality of olives were studied.

Material and method: Olives were packaged under active (5% oxygen + 50%, 70% and 90% carbon dioxide and nitrogen) atmospheres using low density polyethylene film stored at room temperature for 21 days. The color values (L*, C* and H°) were approximately constant after 9 days under 90% CO₂ in headspace of packaged olives. For packaged fruit, mass loss was less than 2%; however, unpackaged olives lost 60% of their initial fresh mass until the end of storage. The total polyphenol (TP) and total anthocyanin (TA) contents, along with the antioxidant characteristics, were continuously monitored during the treatment on a 3 days interval basis, in order to identify possible changes in the quality of olives related mainly to changes in the polyphenolic contents.

Result and discussion: The storage of olives under CO₂ atmosphere resulted in pronounced decreases in TP and increases TA contents, during the storage time. Furthermore, storage under CO₂ contributed to flavor appearance with the development of fruity/floral notes, and reduced bitterness. The in vitro antioxidant properties of the 50% and 70% CO₂-treated samples showed notable increases compared with the sample stored under regular atmospheric conditions and control fruits. It was concluded that storage of olives under a modified atmosphere packaging with 50% and 70% CO₂ atmosphere resulted in the appearance of desired sensory attributes, by decreasing bitterness and developing aroma and color, and the functional (antioxidant) properties were improved. This approach may be used as an alternative, chemical-free means of table olive debittering.

Keywords: Carbon dioxide, Modified atmospheres Packaging, Debittering, Olive, Polyphenols, Post-harvest treatments