

Antioxidant compound changes during cold storage of minimally processed globe artichoke heads

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Abstract

In order to prevent damages of perishable vegetables during storage, it is necessary to maintain their nutritional value and sensory properties. Artichoke is very perishable because of its high respiratory activity and susceptibility to weight loss, decay and biochemical and physiological damages. The high amount in phenolic compounds makes globe artichoke heads a source of antioxidants, but on the other hand the polyphenol oxidase (PPO) enzyme activity is the main factor causing browning in head tissue, reducing the capitula shelf life. To avoid postharvest disorders and extend shelf life, the use of different head treatments before storage could help to realize these goals. In this work, the total phenolic acid changes of two globe artichoke genotypes ('Violetto di Sicilia' and 'Violet of Provence') heads during cold storage subjected to four treatments such as dipping in distilled water (control – T1), 2% ascorbic acid in distilled water (T2), 1% citric acid in distilled water (T3) and coating with citric acid loaded with sodium alginate (T4), were investigated. The treated heads were placed inside perforated polypropylene food bags (five × bag) and stored at the temperature of $4\pm 1^{\circ}\text{C}$ for four weeks. At harvest and after every week of chilling storage for a total of five samplings on 3 bags (experimental unit), head weight (g), dry matter (%), total phenolic acid content ($\text{mg}_{\text{GAE}} \text{kg}^{-1} \text{FW}$) were analysed. During the weeks of storage, a constant loss of head weight was observed in each treatment; the T4 resulted in the lowest losses in head weight. At harvest, total phenols resulted, on average of genotypes, $1375 \text{ mg}_{\text{GAE}} \text{kg}^{-1} \text{FW}$ averaged for weeks of storage and genotypes, total phenolic acid degradation resulted more marked using T1 and T2 than the other treatments. The obtained results showed a good influence of the treatments on the capitula weight losses and phenolic acid variation.