Inhibition of browning via aqueous gel solution of *Aloe vera*: a new method for preserving fresh fruits as a case study on fresh kernels of Persian walnut

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Abstract

Aloe Vera (AV) gel is commonly used as a natural, inexpensive, edible coating that can improve the quality and shelf life of fruits. The objective of this study was to evaluate how two methods of applying *AV*, i.e. as an edible coating (dry environment) and as a gel solution (aqueous environment: a new method), prevent browning and maintain quality characteristics of fresh kernels of Persian walnut for 60 days during cold storage. Distilled water was used as a control group for both environments. In general, *AV* caused a reduction in the peroxide value (POV) of kernels, while preserving Total Phenolic Compound and Total Antioxidant Activity (TAA). The *AV* treatment slowed down the process of color change and maintained sensory properties during storage, compared to the control groups of both methods. The *AV* gel solution performed better than the *AV* edible coating in terms of POV, color (L^* and $h°$) and microbial growth. In contrast, the *AV* edible coating was more effective in preserving TPC and TAA. Also, TAA was found to have a significant, positive correlation with L^* and, simultaneously, a negative correlation with POV. As far as we know, this is the first instance that the *AV* gel was used as a formulated solution and as an edible coating on fresh fruits. This innovative method can be used in commercial practice, while being ecofriendly and non-chemical as a treatment for the maintenance of postharvest quality in fruits.