Effect of gamma irradiation on antioxidants, microbiological properties and shelf life of pomegranate arils cv. 'Malas Saveh'

Meysam Ashtari, Orang Khademi, Mahmoud Soufbaf, Hamideh Afsharmanesh and Mohammad Ali Askari Sarcheshmeh

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Abstract

In the present study, the effect of gamma irradiation on the reduction of microbial population and the maintenance of qualitative attributes of arils in pomegranate cv. Malas-e-Saveh in post-harvest stage was investigated. For this purpose, pomegranate arils, after being separated from the fruit, were irradiated with gamma doses of 0 (as control), 1, 3 and 5 kGy, packed in polyethylene container using cellophane film, and then maintained at 4 °C and relative humidity above 80%. After 7 and 14 days of storage, the arils were removed from the storage and were examined for count of bacteria, fungi and yeasts, anti-oxidant properties and other qualitative characteristics. The results indicated that gamma irradiation in all doses significantly reduced the population of bacteria, fungi and yeasts when compared with control. However, in comparison with control, samples irradiated with gamma irradiation, especially in high doses, contained lower soluble solids, titratable acidity, phenol, anthocyanin and ascorbic acid contents, antioxidant capacity and activity of polyphenol oxidase enzyme, but higher hydrogen peroxide content. Therefore the effects of gamma irradiation in low dose (1 kGy) on the quality of arils were not considerable and would be effective in increasing the shelf life of pomegranate arils.