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Shelf Life and Overall Quality of Pretreated and Modified Atmosphere Packaged 'Ready-To-Eat' Pomegranate arils cv. Bhagwa Stored at 1^{0}C

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Abstract : The effect of different pretreatments and modified atmosphere packaging on the quality of minimally processed pomegranate arils of Bhagwa cultivar was evaluated during storage at 1^{0}C for 16 days. Hand extracted pomegranate arils were pretreated with different antioxidants and surfactants viz., 100ppm sodium hypochlorite plus 0.5 percent ascorbic acid plus 0.5 percent citric acid, 10 and 20 percent honey solution, 0.1 percent nanosilver stipulated food grade hydrogen peroxide alone and in combination with 10 percent honey solution and control. The disinfected, rinsed and air-dried pomegranate arils were packed in polypropylene punnets (135g each) with different modified atmospheres and stored up to 16 days at 1^{0}C. Changes in colour, pH, total soluble solids, sugars, anthocyanins, phenols, acidity, antioxidant activity, microbial and yeast and mold count over initial values were recorded in all the treatments under study but highest on those without antioxidant and surfactant treatments. Pretreated arils stored at 1^{0}C recorded decrease in L*, b* value, pH, levels of non-reducing and total sugars, polyphenols, antioxidant activity and acceptability of arils and increase in total soluble solids, a* value, anthocyanins and microbial count. Increase in anthocyanin content was observed in modified atmosphere packaged pretreated arils stored at 1^{0}C. Modified atmosphere packaging with 100 percent nitrogen recorded minimum changes in physicochemical and sensorial parameters with minimum microbial growth. Untreated arils in perforated punnets and with air (control) gave shelf life up to 6 days only. The pretreatment of arils with 10 percent honey plus 0.1 percent nanosilver stipulated food grade hydrogen peroxide and packaging in 100 percent nitrogen recorded minimum changes in physicochemical parameters. The treatment also restricted microbial growth and maintained colour, anthocyanin pigmentation, antioxidant activity and overall fresh like quality of arils. The same dipping treatment along with modified atmosphere packaging extended the shelf life of fresh ready to eat arils up to 14 to 16 days with enhanced acceptability when stored at 1^{0}C.

Keywords : anthocyanin content, pomegranate, MAP, minimally processed, microbial quality, Bhagwa, shelf-life, overall quality

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