

Title A novel active packaging based on MAP and addition of essential oils maintains plum quality and enhances antioxidant properties

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Abstract

In this work the effect of modified atmosphere packaging (MAP) in combination with the addition of a mixture of 3 essential oils (eugenol, thymol, and carvacrol, 25 µL each) inside packages on maintaining 'Black Amber' plum quality parameters was assayed. Fruit were thermo-sealed in baskets with 2 distinct films (M and P) which differed in permeability. Fruit stored with macroperforated film served as control and lost their quality attributes very rapidly manifested by accelerated colour changes, softening, decrease in acidity and increase in total soluble solids. The use of MAP with essential oils retarded these changes, the efficacy being higher in the fruit packed with film M compared with film P as a result of the delay in the postharvest ripening process, which could be attributed to the effect of MAP on reducing ethylene production rate. With the use of these packages, the storage time with fruit having high quality attributes could be increased 3-4 weeks more as compared with control plums. In addition, the bioactive compounds (total phenolics and anthocyanins) showed a delay in the accumulation associated with the retardation in the ripening process. However, total antioxidant activity remained unchanged in control fruit and an increase was observed in those plums packed under MAP conditions containing essential oils. As far as we know, this is the first time in which an active packaging based on MAP and essential oils show efficacy on maintaining antioxidant properties in both peel and pulp.