Quality and volatile organic compounds emission alterations in ‘August Flame’ peaches due to low dose methyl bromide fumigation

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Abstract

As all perishable fruit, peaches must be stored in cold temperature during transportation for maintenance of fruit quality. Australian peaches exported to China must undergo fumigation quarantine treatments prior to shipment for biosecurity reasons. ‘August Flame’ peaches were fumigated with methyl bromide (MB) at the low dosage of 18 g/m^3 for 5.5 h at flesh temperature of 18 °C, as a biosecurity disinfestation treatment, with a subsequent cold storage period at 2 °C and 4 °C for 5 and 9 d to simulate air freight transportation. Fruit quality parameters measured during shelf life (SL) were: firmness, index of delta absorbance (I_{AD}), ethylene production and respiration. Four families of volatile organic compounds (VOCs) from samples of fruit flesh and skin were analysed along SL: aldehydes, alcohols, esters and lactones. Overall trends in the evolution of quality parameters and VOCs emissions were identified. Fumigation, under our experimental conditions, anticipated the climacteric ethylene peak, but did not affect fruit quality enough to be detrimental for consumption and did not cause skin or internal disorders. During SL aldehydes decreased, lactones increased, alcohols were higher in skin than in flesh, but none of these general trends were clearly affected by the fumigation.