Postharvest quarantine vapour heat treatment attenuates disease incidence, maintains eating quality and improves bioactive compounds of ‘Gola’ and ‘Surahi’ guava fruits

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Abstract

Fruit fly infestation is the major concern in commercial guava production globally, which limits its marketing opportunities, especially export to high end markets. Vapour heat treatment (VHT) technology is used for quarantine purposes in various tropical fruits for export, however, detailed information is lacking on its impacts on fruit quality and shelf life of guava. In current studies, the effect of VHT was evaluated on two commercial guava cultivars (Gola’ and ‘Surahi) of Pakistan. Mature green guava fruits were subjected to VHT at a commercial certified facility, maintaining core pulp temperature of 47.5 °C for 0, 12 and 25 min, followed by keeping fruit at ambient conditions (28 ± 2 °C) for six days. The fruits treated with VHT maintaining core temp of 47.5 °C for 25 min displayed higher marketability index, cosmetic quality, firmness and pulp color with lower disease incidence, ion leakage, and weight loss during ambient storage conditions. Soluble solid contents (SSC), sugar acid ratio, ascorbic acid contents and total phenolic contents were also higher with better eating quality in fruits treated with VHT-25 min, compared with VHT-12 min, and untreated control. However, total antioxidants (% DPPH inhibition activity) and titratable acidity of fruits were not affected by VHT duration. Conclusively, VHT (47.5 °C for 25 min) could be employed as eco-friendly and safe quarantine treatment for both guava cultivars, with maintained physical, biochemical and eating quality.