

Effect of packaging on postharvest disease development and quality of gamma irradiated litchi fruits

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Abstract

The effect of packaging on the quality and fruit rot development of gamma irradiated 'Chakkaphat' litchi fruits was investigated. Harvested litchi fruits were cleaned with a cooled solution of 100 ppm sodium hypochlorite at 10°C and then packed in nylon net bags (control), PET (Polyethylene terephthalate) trays covered with Active bags (Equilibrium Modified Atmosphere film), or PET trays wrapped with PVC film. Packages were placed in export cartons, and the cartons containing different types of packages were then separated into two groups for irradiating with gamma rays at $400 \pm 10\%$ Gy and for non-gamma irradiation. Irradiated and non-irradiated litchi fruits in the different packages were then kept at 4°C for 28 days. The experiment was designed and analyzed as a factorial complete randomized design. The results showed that the most suitable package for gamma irradiated litchi fruits was the PET tray covered with Active bag as it significantly delayed postharvest disease development, and reduced the browning index, weight loss, the activity of polyphenol oxidase, and also maintained anthocyanin content in the pericarp when compared with packing in nylon net bags. Gamma irradiation resulted in the induction of peel browning but it did not influence the severity of fruit rot disease. However, ascorbic acid content, titratable acid, total soluble solids, total phenolic compounds, and the phenylammonialyase (PAL) activities were not significantly different among all treatments. This result implied that the PET tray covered with Active bag (EMA film) was the best container for delaying fruit rot disease and maintaining the quality of gamma irradiated litchi fruits.