

# Effects of acetic acid fumigation on suppressing postharvest decay of gamma irradiated longan fruit

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## Abstract

Longan is an economical subtropical fruit produced in northern and eastern regions of Thailand and exported to many countries. Postharvest chemical treatments are commonly used to control pest infestation and fruit decay during transportation and storage. At present, health-conscious consumers are creating an increasing demand for food safety. Therefore, safe alternative methods for controlling postharvest pests and diseases were studied. The aim of this experiment was to study the effects of acetic acid (AA) fumigation on suppressing postharvest decay of gamma irradiated longan fruit during storage at 4°C. Harvested 'Daw' longan fruit were fumigated with glacial AA (99.5%) in a closed chamber with a small ventilation fan. The AA fumigated fruit were then irradiated with gamma rays at 400±10% Gy. Longan fruit fumigated with and without 1,000 ppm sulphur dioxide (SO<sub>2</sub>) previously treated with gamma irradiation were used as controls. All treated fruit were stored at 4°C for 28 days. The percentages of fruit decay and fruit quality were measured every 7 days. AA fumigation retarded fruit rot by 26-39% when compared with non-SO<sub>2</sub> fumigation; however, the effect of AA fumigation on the control of fruit rot was lower than SO<sub>2</sub> fumigation (53-60%, compared with non-SO<sub>2</sub> fumigation). However, AA fumigation enhanced negative effects on the quality of irradiated fruit because it caused cracks in the fruit peel as observed using a Scanning Electron Microscope. This AA injury might cause high weight loss, dehydration of peel (high firmness), and enhanced browning of inner peel. There were no significant differences in pulp color and electrolyte leakage of pulp in all treatments. This result implied that although AA fumigation is able to reduce fruit rot it cannot be used for maintaining fruit quality of irradiated longan.