

Effect of ^{60}Co gamma irradiation on postharvest quality and selected enzyme activities of *Volvariella volvacea*

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Abstract

Volvariella volvacea fruit bodies were exposed to six different dosage levels (0, 0.2, 0.4, 0.6, 0.8, and 1.0 kGy) of ^{60}Co gamma ray source, and then stored at 16 °C and 55–60% relative humidity for 7 d. Storage of the 0.8-kGy treatment group resulted in the highest sensory evaluation score, (increase by 51.85% than other treatments). The activity of selected enzymes involved in postharvest deterioration were also studied. The results showed that irradiation treatments have achieved significantly better commercial appearance after 7 d of storage due to slower postharvest mushroom softening, browning, weight loss (10.53%–34.73%) and respiration rate (17.20%–48.72%) than control. respectively. Samples irradiated with the 0.8-kGy dose performed better than other treatments. The control showed a significantly higher malonaldehyde (MDA) level than the irradiated samples (5.5%–45.27%). Increased catalase (CAT) activity ($P < 0.05$) was also observed in the samples receiving doses of 0.8 and 1.0 kGy after storage for 4 and 5 d, respectively. Superoxide (SOD) dismutase activities in the irradiated samples (13.68–40.53%) were significantly higher than those of the control, while the microbial populations decreased in all irradiated samples compared with the control. These findings suggested that irradiating *V. volvacea* mushrooms with 0.8 kGy of ^{60}Co gamma rays could maintain their quality.