

Effects of ozone fumigation combined with nano-film packaging on the postharvest storage quality and antioxidant capacity of button mushrooms (*Agaricus bisporus*)

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Abstract

The quality of button mushrooms (*Agaricus bisporus*) deteriorates rapidly in storage, which seriously affects their commodity value and shelf-life. In this work, preservation using ozone fumigation combined with nano-film packaging was used for the first time to maintain the freshness of *A. bisporus*. Three key quality attributes, sensory score, browning index, and weight loss rate, were used to select the optimal ozone treatment dosage of *A. bisporus*. According to the selected optimal ozone fumigation dosage and using untreated mushrooms as controls, comparative freshness was tested in mushrooms treated with ozone fumigation, nano-film packaging, and a combination of ozone fumigation and nano-film packaging. During storage, a series of the quality indicators and antioxidant capacity of *A. bisporus* were determined. The results showed that the ozone fumigation treatment combined with nano-film packaging effectively delayed the deterioration of sensory quality, weight loss, firmness, peak respiration, and browning, while inhibiting the outbreak of epiphytic microorganisms and the accumulation of reactive oxygen species during the postharvest storage of mushrooms. Hence, the mushrooms maintained good appearance and texture characteristics during storage and retained a higher commercial value. Compared with the control group, ozone fumigation combined with nano-film packaging treatment extended the shelf-life by 8–10 d. Therefore, this treatment can be used as an effective composite freshness-keeping technology in the postharvest storage and distribution of *A. bisporus*.