

Title Effect of modified atmosphere packaging (MAP) with low and superatmospheric oxygen on the quality and antioxidant enzyme system of golden needle mushrooms (*Flammulina velutipes*) during postharvest storage

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Keywords Golden needle mushroom; High oxygen atmosphere packing (HOAP); Antioxidant; Senescence; Fresh-keeping

Abstract

To quantify the effect of oxygen concentrations on the quality and antioxidant enzyme system of stored golden needle mushroom, modified atmosphere packaging (MAP) with low and initial superatmospheric oxygen was applied during mushroom storage, and physiological changes associated with postharvest deterioration, activities of antioxidant enzymes, and of cellulase, were monitored during subsequent storage for 0–34 days. Golden needle mushrooms stored in MAP without oxygen or 20–50% oxygen rate had a poorer sensory quality because of chilling injury and physiological injury. These injuries included increased levels of malondialdehyde and superoxide anion whereas some extent of browning was observed. The antioxidant enzyme system, including superoxide dismutase, catalase, peroxidase, and polyphenol oxidase, was activated, to scavenge the reactive oxygen species to reduce injury during the initial storage period. However, these injuries also induced senescence of the stored golden needle mushroom during later storage, followed by a decrease in activities of the antioxidant enzymatic system. The activities of the antioxidant enzymatic system of the mushroom stored in MAP with 80% oxygen rate were the most favorable to delay the senescence process in the later period of storage, and the mushrooms had the best quality until the end of storage. MAP with high oxygen concentrations (e.g., 80% oxygen rate) can induce relatively high antioxidant capacity, significantly decrease postharvest quality loss and improve shelf life of fresh mushrooms.

<http://www.springerlink.com/content/b2185311442106w6/fulltext.pdf>