

Improvement of postharvest quality, enzymes activity and polyphenoloxidase structure of postharvest *Agaricus bisporus* in response to high voltage electric field

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Abstract

High voltage electric field (HVEF) is an innovative technology used in the non-thermal food processing. To explore effects of HVEF on the postharvest quality and its possible mechanisms of *Agaricus bisporus* (mushroom), *Agaricus bisporus* were stored in the HVEF at 4 °C for 12 days. The results revealed that HVEF could reduce the loss of firmness and maintain the whiteness index for *A. bisporus* samples after 12 days of storage. Furthermore, HVEF treatment significantly prevented the accumulation of malondialdehyde (MDA), delayed loss of total phenolic, enhanced the superoxide dismutase (SOD) and catalase (CAT) activity, and had the better microstructure compared with that in the control group. In addition, HVEF treatment induced the rearrangement of secondary structure and irreversibly disrupted the tertiary structure of the polyphenol oxidase (PPO) to bury the active site, resulting in inactivation of PPO. These results indicated that HVEF treatment is a potential approach to prolong the shelf life of *A. bisporus*, maintaining its postharvest quality and consumer acceptance during storage.