

Title Effect of nanocomposite-based packaging on postharvest quality of ethylene-treated kiwifruit (*Actinidia deliciosa*) during cold storage

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Abstract

A novel nanocomposite-based packaging (NCP) was prepared by blending polyethylene (PE) with nano-Ag, nano-TiO₂ and montmorillonite. The effects of NCP on the quality parameters of ethylene-treated mature kiwifruit were investigated during the 42 d of storage at 4 °C. The results showed that adding nanoparticles to the PE significantly decreased the oxygen, water vapor permeability and longitudinal strength, and inhibited spore germination. The weight loss, softening, color variation and soluble solid content of kiwifruit were significantly inhibited by 22.67%, 124.84%, 23.46% and 14.42% respectively, which indicated that NCP could delay the ripening of kiwifruit. However, ascorbic acid and total phenols contents in NCP-treated fruit were increased compared with the controls. Additionally, kiwifruit in NCP exhibited 57.44% lower headspace ethylene concentration, 29.44% for malondialdehyde (MDA), lower polyphenol oxidase (PPO) activity and higher peroxidase (POD) activity than the controls. These results suggest that NCP may be a useful technique to reduce fruit decay and maintain quality in kiwifruits during postharvest storage.