Abstract

Lignification is an important inducement of quality deterioration of postharvest Flammulina velutipes. In this study, phenylpropanoid pathway and mitochondrial reactive oxygen species (ROS) metabolisms were taken as breakthrough points to investigate the lignification mechanism in harvested F. velutipes packaged in nanocomposite packaging material (Nano-PM). In comparison with polyethylene packaging material (Normal-PM) and no packaging material (No-PM), Nano-PM prevented the decrease of L* value and the increase of firmness. Nano-PM also maintained a better microstructure. Furthermore, Nano-PM reduced the deposition of lignin by suppressing the enzymes activities involved in phenylpropanoid pathway. In addition, the regulation of ROS in mitochondria alleviated the accumulation of Ca2+ and inhibited the programmed cell death (PCD) process, which ultimately delayed the lignification process. These results indicated that Nano-PM delayed the lignification process by regulating phenylpropanoid pathway and the accumulation of ROS in mitochondria.