

# Involvement of energy metabolism and amino acid metabolism in quality attributes of postharvest *Pleurotus eryngii* treated with a novel phase change material

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## Abstract

Phase change material (PCM) is a substance which absorbs latent heat by a phase transition, and it plays important roles in short-time cold chain transportation. In the present study, we developed a novel water-based PCM, which showed a better effect on maintaining low-temperature conditions compared with ice, and applied in postharvest storage of *Pleurotus eryngii* at room temperature for 5 d. The results showed that the novel PCM treatment alleviated the deterioration of the visual appearance of *P. eryngii*. Amino acids assay revealed the novel PCM treatment improved the accumulation of phenylalanine, glutamate, and proline. Increased phenylalanine potentially delayed the decrease of total phenolic and flavonoid, and increased glutamate enhanced characteristic flavors of *P. eryngii*. In addition, a high level of proline contributed to delayed postharvest senescence by maintaining the membrane integrity, as well as promoting antioxidant capacity. Further, the energy status assay clarified that the novel PCM treatment maintained sufficient energy supply in *P. eryngii* by activating succinate dehydrogenase, cytochrome C oxidase, and ATPase activities, therefore should partially contribute to the decrease of catabolism of glutamate and proline as a result. Our current study indicated that the novel PCM might be a good substitute for ice in cold chain transportation of postharvest *P. eryngii*.