

Effects of *Oudemansiella radicata* polysaccharide on postharvest quality of oyster mushroom (*Pleurotus ostreatus*) and its antifungal activity against *Penicillium digitatum*

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Abstract

The effects of a water-soluble polysaccharide from *Oudemansiella radicata* (ORWP) on the postharvest quality of *Pleurotus ostreatus* were investigated. In the present work, oyster mushroom was divided into four groups which were treated separately with distilled water (control), and ORWP at 5, 10 and 15 g L⁻¹ concentration, respectively, and kept at 4 °C for 15 d. The results showed that treatment with ORWP was effective in maintaining the sensory quality of oyster mushrooms. Mushrooms that were ORWP-coated displayed, compared to the control, reduction in the following parameters: weight loss, relative electrolyte leakage, phenol peroxidase (PPO) activities and malondialdehyde (MDA) content. In addition, ORWP-coated mushrooms maintained activities of superoxide dismutase (SOD) and catalase (CAT), contents of ascorbic acid, carbohydrate, soluble protein and phenolic compounds which were all higher than those of the control. Furthermore, the antifungal activity and underlying mechanisms of ORWP against *Penicillium digitatum* were investigated. The minimum inhibitory concentration (MIC) was 0.25 g L⁻¹ and the minimum fungicidal concentration (MFC) was 1.00 g L⁻¹. A combination of hyphal membrane permeability analysis, scanning electron microscopy (SEM) and transmission electron microscopy (TEM) revealed that the antifungal activity of ORWP was attributed to disruption of hyphal cell membrane integrity, leading to leakage of intracellular materials, and impaired cellular metabolism, thereby thwarting the growth of *P. digitatum*. Therefore, ORWP is a promising preservative agent for postharvest oyster mushrooms and could be used as an inhibitor of fungi in food and medicine.