

Studies on selective white rot by *Ceriporiopsis subvermispora*

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A selective lignin-degrading fungus, *Ceriporiopsis subvermispora*, can degrade lignin without intensive damage of cellulose. We have demonstrated that extracellular lipid peroxidation by manganese-dependent peroxidase (MnP) occurred in the selective white rot by *C. subvermispora*. At an incipient stage of wood decay, this fungus produced MnP and large amounts of unsaturated and saturated long chain fatty acids, leading the generation of radicals [1]. Moreover, ceriporic acid B (1-nonadecene-2,3-dicarboxylic acid), an extracellular metabolite produced by *C. subvermispora*, inhibits the generation of cellulolytic and ligninolytic hydroxyl radicals [2]. These observations suggest that extracellular enzymes and low molecular mass metabolites play key roles in the selective lignin degradation. However, the selectivity by *C. subvermispora* changes in various culture conditions [3-4]; thereby it has remained to be elucidated what factors are required for the selective lignin degradation.

In the present study, we investigated degradation patterns of wood cell wall components, activity of ligninolytic enzymes, and production of metabolites, such as fatty acids and ceriporic acids by *C. subvermispora* under various conditions. On wood meal cultures, the selectivity of lignin degradation under low nitrogen condition was much higher than in high nitrogen media. The significant lignin loss was found when both high MnP activity and decrease in accumulated linoleic acid were concomitantly observed, suggesting that lipid peroxidation is involved in the ligninolysis. On a synthetic liquid medium, furthermore, the concentration of nitrogen significantly affected the lipid metabolic profiles. Large amounts of linoleic acid were secreted by the fungus by addition of lignin fragments under high nitrogen conditions. These observations shed light on candidate factors involved in the selective lignin degradation by *C. subvermispora*.

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