ABSTRACTS (MASTER THESIS)

Screening of candidate enzymes involved in the biosynthesis of lipid-related metabolites and proteomic analysis of intracellular proteins from the selective white-rot fungus *Ceriporiopsis subvermispora* against exogenous addition of vanillin

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A white-rot fungus, *Ceriporiopsis subvermispora*, is characterized as one of the best bio-pulping fungi because it can selectively degrade lignin without serious damage to cellulose. This fungus extracellularly produces a series of itaconic acid derivatives, ceriporic acids A-C, having a long alkyl and alkenyl side chain at the C3 position [1]. In particular, ceriporic acid B suppresses iron redox reactions to inhibit the production of cellulolytic hydroxyl radicals by the Fenton reaction [2-3]. Moreover, we found that the production of ceriporic acids was increased when *C. subvermispora* was grown on a glucose-containing synthetic medium supplemented with vanillin, one of the key intermediates found during lignin biodegradation. The biosynthetic pathway of ceriporic acids remains to be elucidated although its model pathway is proposed [4]. In this study, we tried to screen candidate genes involved in the biosynthesis of ceriporic acids and also to express them heterologously.

On the other hands, we also performed fluorescence two-dimensional difference gel electrophoresis (2D-DIGE) using intracellular proteins from *C. subvermispora* grown in the presence and absence of vanillin [5]. Peptide mass fingerprinting identified numerous intracellular proteins that were involved in metabolism, cellular processes, signaling, and so on. These results will shed light on the molecular mechanism of the selective lignin degradation of *C. subvermispora*.

References

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