

Cellular response of a selective white rot fungus, *Ceriporiopsis subvermispora* to vanillin

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Selective white-rot fungus, *Ceriporiopsis subvermispora* is able to degrade lignin without serious damage to cellulose. *C. subvermispora* secretes extracellular lignin-degrading enzymes including manganese peroxidase (MnP) and laccase (Lac). This fungus also secretes unsaturated fatty acids and lipid-related metabolites called ceriporic acids. In the selective white rot, lignin degradation by lipid peroxidation of unsaturated fatty acids and inhibition of cellulose degradation by ceriporic acids have been proposed as a key reaction for the selective ligninolysis. In lignin biodegradation by white rot fungi, vanillin has been found as one of the major degradation products from lignin. Previously it was reported that vanillin induced secretion of fatty acids, Lac and ceriporic acids by *C. subvermispora*. This suggests that vanillin may activate lipid metabolism by *C. subvermispora*. In the present study, cellular response of *C. subvermispora* to vanillin was analyzed by measuring fungal weight, activity of lignin-degrading enzymes and intracellular proteins expressed in the fungal cultivation. In the presence of vanillin, increase in fungal weight and laccase production was found. Two-dimensional electrophoresis coupled by in-gel tryptic digestion and MALDI-TOF MS revealed detailed profiles of the proteins up-regulated or down-regulated in response to the vanillin administration.