ABSTRACTS (MASTER THESIS)

Ion-reducing polypeptides from white rot fungus

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Continued usage of fossil fuels has caused depleted energy problems and serious environmental issues such as global warming. Therefore, production of energy and chemicals from the most abundant renewable resources, woody biomass is an urgent task for ensuring sustainability of our life. In biological conversion of woody biomass, selective lignin degradation is a key process because cell wall polysaccharides in wood are surrounded by lignin. In nature, the degradation of lignin in wood occurs primarily through the action of lignin-degrading basidiomycetes called white rot fungi; consequently, this ecological group has received a considerable amount of research attention. Most of white rot fungi simultaneously decompose lignin and cellulose, accompanied by erosion of wood cell walls, while some fungi called selective white rot fungi, such as *Ceriporiopsis subvermispora* are able to degrade lignin without intensive damage of cellulose. Thus, a white rot fungus *C. subvermispora* is useful for the production of bioethanol, biomethane, pulp and feed for ruminant animals due to its selective lignin-degrading ability. This fungus secretes hydrophobic metabolites such as fatty acids and alk(en)ylitaconic acids (ceripiric acids). These metabolites play important roles in the selective lignin-degrading system. In this study, extracellular polypeptides secreted by the fungus were analyzed by using the assay for Fe (III) and Cu (II) reduction. After purification by ammonium sulfate precipitation and gel permeation chromatography, the polypeptide fraction was separated. 2D-Elecrtophoresis demonstrated that at least two polypeptides were involved in the fraction. The peptides may play a role in extracellular redox reactions of this fungus to promote the lignin degradation by free radial process.