A selective lignin-degrading fungus, *Ceriporiopsis subvermispora* produces extracellular polar lipids

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A selective lignin-degrading basidiomycete, *Ceriporiopsis subvermispora* is able to degrade lignin in wood without intensive damage of cellulose. During wood decay by this fungus, extensive delignification is observed without the penetration of extracellular enzymes into the wood cell wall regions [1]. This indicates that *C. subvermispora* has unknown delignification systems catalyzed by low molecular weight metabolites. We demonstrated that *C. subvermispora* produced saturated and unsaturated free fatty acids during wood decay. We also isolated a series of novel alkylitaconates (ceriporic acids) that inhibit cellulose degradation by the Fenton reaction [2,3]. However, our knowledge on hydrophilic metabolites produced by *C. subvermispora* is still limited. Therefore, the present study is aimed at isolating key polar metabolites that are able to interact with hydrophobic substances like lignin and lipids.

C. subvermispora was cultured in a SDW medium at 28°C for 6 weeks. Polar metabolites were purified from the culture fluid of *C. subvermispora* by extraction with ethanol and acetone. The extracts were analyzed by thin-layer chromatography (TLC) using chloroform/acetone/methanol/acetic acid/water = 9/4/4/2/1 as a developing solvent. As a result, polar metabolites with *Rf* values, 0.58-0.87 were separated. Then, the extracts were further purified by solid phase extraction and reversed-phase high performance liquid chromatography (HPLC). The purified polar lipids were analyzed by liquid chromatography/electrospray ionization mass spectrometry (LC/ESI-MS) and detected deprotonated molecules of the metabolites.

These polar lipids have both hydrophilic and lipophilic moiety in a molecule. Therefore, these metabolites may play a central role in the selective lignin degradation by interacting with hydrophobic metabolites and lignin during wood decay.

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