
ABSTRACTS (MASTER THESIS)

Fractionation and analyses of lignin-carbohydrate complexes in woody biomass

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Woody biomass consists of lignin, cellulose, and hemicellulose. Lignin is a recalcitrant aromatic polymer which has a three-dimensional network structure in wood cell walls. Lignin is promising as a chemical raw material because aromatic rings can utilize as raw materials for various chemical products. Here, we focus on Lignin-Carbohydrate Complexes (LCCs), which have covalent bonds between polysaccharide and lignin [1]. The abundance of LCCs is small in wood cell walls, but significantly important in physical and chemical properties. Thus, a better understanding about LCCs is necessary to develop an efficient conversion system of woody biomass. In this study, we try to fractionate and analyze LCCs from hardwood. We separated an LCC fraction in combination with enzymatic digestion, solvent extraction, and column chromatography, and analyzed by 2D-HSQC NMR.

References

[1] Nishimura, H., Kamiya, A., Nagata, T., Katahira, M., Watanabe, T. Direct evidence for alpha ether linkage between lignin and carbohydrates in wood cell walls. *Sci. Rep.* 8:6538 (2018).