

INVESTIGATION OF POTENTIAL INHIBITORS FROM SWITCHGRASS IN BIOREFINERY

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Pretreatment of biomass prior to saccharification and fermentation into biofuels is an inseparable part in the operation of a biorefinery. However, the yields from saccharification and fermentation processes can be negatively impacted by the presence of phenolic compounds, non-binding inhibitors in the pretreated biomass. In this present study, after liquid pressurized extraction of three varieties of switchgrass with water and ethanol, total phenolics equivalent of the extractives of three varieties of switchgrass grown on a large scale in three different farms was determined at vegetative, transition and reproductive growth stages from two growing seasons. Principal component analysis of HPLC chromatograms of switchgrass extractives will be performed to discriminate between the switchgrass varieties at three different growth stages. Furthermore, partial least squares regression model will also be built using chromatograms and total phenolic equivalent to predict the total phenolic equivalent of switchgrass samples. Statistical analysis will also be performed to assess the variability of total phenolics equivalent between the varieties as well as impact of location where the samples were harvested. Furthermore, the relevance of the total phenolics equivalent will be assessed on the extraction method in the processing of the biomass in a biorefinery.