Petrochemistry-2013

OMICS Group Conferences
Accelerating Scientific Discovery

World Congress on
Petrochemistry and Chemical Engineering

November 18-20, 2013 Hilton San Antonio Airport, USA

Plant cell wall matrix polysaccharide modification improves *Populus* and Switchgrass biomass for utilization for biofuel production

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Abstract

The major challenge to using woody *Populus* and C4 perennial switchgrass as energy crops for industrial processing and bioconversion to fermentable sugars is the rigid plant cell wall which is recalcitrant to bacterial and fungal enzymatic hydrolysis. Plant cell walls are comprised of lignin, cellulose, matrix polysaccharides (pectin and hemicellulose) and cell wall proteins. We took a genetic engineering approach to modify matrix polysaccharide synthesis and structure in both *Populus* and switchgrass. The saccharification efficiency of both the dicot and monocot modified biomass was improved. Furthermore, the ethanol yield from biomass of the modified switchgrass lines was significantly increased in comparison to controls. The reduction in recalcitrance of *Populus* and switchgrass has the potential to lower processing costs for biomass fermentation-derived biofuels and biomaterial production. The role of matrix polysaccharides in recalcitrance and the implications for saccharification will be discussed.

The work was supported by DOE grant DE-AC05-00OR22725 to the BioEnergy Science Center (BESC). The BioEnergy Science Center is a U.S. Department of Energy Bioenergy Research Center supported by the Office of Biological and Environmental Research in the DOE Office of Science.

Biography

Ajaya K Biswal has completed his PhD at the age of 29 years from Utkal University and postdoctoral studies from Umea Plant Science Center, Sweden and University of Georgia, USA. He is currently working as Assistant Research Scientist at Complex Carbohydrate Research Center, University of Georgia, USA. He has published more than 12 papers in reputed journals.