

# World Bioenergy Congress and Expo

June 13-14, 2016 Rome, Italy

## An eco-friendly enzyme mediated biomass pretreatment and hydrolysis towards bioethanol production

Rajiv Chandra Rajak and Rintu Banerjee

Indian Institute of Technology, Kharagpur, India

There is a growing interest worldwide in utilization of bioresources through biobased processes leading to channeling considerable effort towards development of new and efficient technologies. Enzymes produced from microorganism's acts as a green route for lignocellulosic biomass pretreatment. *Saacharum spontaneum* or Kans grass is a potential lignocellulosic rich in cellulose (38.70 %), hemicelluloses (29.00 %), and lignin (17.46 %). To utilize the major proportion of the carbohydrates such as cellulose and hemicelluloses to produce reducing sugar, degradation of lignin is an important prerequisite in bioethanol production process. In the present work, an enzymatic pretreatment process for lignin degradation or delignification has been optimized through response surface methodology (RSM) based on central composite design (CCD). The maximum delignification recorded was 81.67% at 6 h upon monitoring the lignin content of 17.46%. The effectiveness of the enzymatic pretreatment process was investigated through various microscopic and spectroscopic tools as well through porosity analysis that evidenced the specific action of enzyme on lignin. Moreover, the efficacy of enzymatic pretreatment process on enzymatic hydrolysis was studied through optimization based on central composite design. The maximum reducing sugar obtained was 500.30 mg/g at 5.30 h of incubation time which indeed support the potential of enzymatic mode of biomass pretreatment.

### Biography

Rajiv Chandra Rajak is currently pursuing PhD under the guidance of Prof. Rintu Banerjee from Indian Institute of Technology, Kharagpur, India. He is working in the area of Biomass Deconstruction using biological catalyst and its role in reducing sugar production. As an outcome of his research activities, he has published 3 research articles in peer reviewed international journals and a patent on biomass delignification. He was also awarded with the best poster award at Asian Congress in Biotechnology-2013, New Delhi, India.

[rajivmbt@gmail.com](mailto:rajivmbt@gmail.com)

### Notes: