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# Yellow laccase mediated delignification: An attempt towards eco-friendly pretreatment of lignocellulosics

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Ever-increasing energy demand in developed as well as in developing nations has prompted worldwide interest in the production of biomass-based fuels as a substitute to petroleum fuels. At this juncture, biofuel production from biomass represents a sustainable resource and a better alternative for achieving zero emissions. This in turn necessitates the development of an efficient biomass delignification method, which is an essential prerequisite for the complete biofuel production process. Lignocellulosics such as Kans grass, sugarcane top, pineapple leaf waste, *Bambusa bambos*, *Ricinus communis* , *Lantana camara* and mixtrue contain 13-20% lignin and 60-70% carbohydrates within its cell walls. To make this enormous amount of carbohydrates more accessible for hydrolysis during fermentation, lignin degradation by yellow laccase has been attempted. In the present study, response surface methodology (RSM) based on central composite design (CCD) has been used to investigate the effects of the various process parameters on biomass delignification. The maximum 80-85% delignification obtained for the above mentioned lignocellulsics within 5-6 h. Thorough study of the raw and pretreated biomass were carried out by elemental composition analyses and energy density measurement. Further structural characteristics of the enzymatically delignified substrate were analyzed by scanning electron microscopy (SEM), Fourier transform infrared (FTIR) spectroscopy, X-ray diffraction (XRD) spectroscopy and porosity analysis that supported the efficacy of the enzymatic delignification process.

## Biography

Rintu Banerjee, Ex-MNRE-Chair-Professor, Indian Institute of Technology, Kharagpur has created a niche of her own in the area of Biomass Deconstruction/Biofuel Production/Enzyme Technology. In the process of her innovative development, she was granted 8 Indian, 3 International (US, Japanese and Chinese) patents. She has published more than 150 papers in peer-reviewed national/international journals and guided many PhD, MS, MTech and Btech students. She is the Editorial Member of many journals. She has written 24 book chapters and authored a book on “Environmental Biotechnology” published by Oxford University Press. She is recipient of various awards/honours given by both government/non-government organizations.

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