

Development of Process to Produce Biofuel from Lignocellulosic Biomass Using Natural Isolate

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We report here the production of pure (R,R)- 2,3-butanediol (2,3-BDO) isomer by the non-pathogenic *Paenibacilluspolymyxa* ICGEB2008 using lignocellulosichydrolysate as substrate. Experimental design based on Plackett-Burman resulted in identification of Mn and K as most crucial salt elements along with the yeast extract for 2,3-BDO production. Further experiments using Box- Behnken design indicated that both KCl and yeast extract together had major impact on 2,3-BDO production. Optimized medium resulted in 2,3-BDO production with 2.3- fold higher maximum volumetric productivity (2.01 g/L/h) and similar yield (0.33 g/g sugar) as compared to rich yeast extract-peptone-dextrose medium in the bioreactor studies. Considering that the balance substrate was channeled towards ethanol, carbon recovery was close to theoretical yield between the two solvents, i.e., 2,3-BDO and ethanol. Biomass hydrolysate and corn-steep liquor was used further to produce 2,3-BDO without impacting its yield. In addition, 2,3-BDO was also produced via simultaneous saccharification and fermentation, signifying robustness of the strain.

Biography:

Nidhi Adlakha is working as Post Doctoral Fellow (Inspire Faculty) in JNU, New Delhi, India. She is working extensively towards understanding cellulose hydrolysis mechanism and developing system for efficient biofuel production. She obtained her PhD degree from International Centre for Genetic Engineering and Biotechnology, New Delhi, India. Her thesis work was on "Development of process to produce biofuel from lignocellulosic biomass using natural isolate" in which she had characterized and isolated potential cellulolytic enzyme systems from *Paenibacillus polymyxa*, isolated from the gut wood feeding insects. Till date, she have 10 papers published in reputed international journals such as Applied and Environmental Microbiology, Biotechnology for Biofuels and Scientific Reports. Alongwith this, she have 3 Indian patents.