conferenceseries.com

Archana Mishra et.al., J Fundam Renewable Energy Appl 2018, Volume 8
DOI: 10.4172/2090-4541-C1-054

9th Annual Congress and Expo on

BIOFUELS AND BIOENERGY

April 16-17, 2018 Dubai, UAE

Bioethanol production from co-culture fermentation using *Candida shehatae* and *Zymomonas mobilis* from kans grass biomass

Archana Mishra and Sanjoy Ghosh
Indian Institute of Technology Roorkee, India

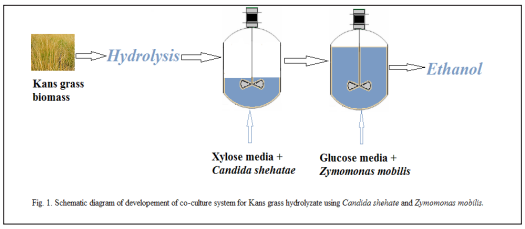

Fig. 1. Schematic diagram of developement of co-culture system for Kans grass hydrolyzate using *Candida shehate* and *Zymomonas mobilis*.

Bioethanol has shown its potential as one of the most promising substitute for gasoline as transportation fuel. As the first-generation ethanol (grain as feedstock) suffers from the criticism of food vs. fuel conflict, therefore, the focus has been shifted to produce second generation (2G) ethanol from alternative feedstocks, mostly agricultural residues as they are abundant, largely unused and cheap containing good amount of polysaccharides. Co-culture fermentation was investigated in this study to produce bioethanol from relatively cheaper lignocellulosic biomass of kans grass (*Saccharum spontaneum*). Consortium of *Candida shehatae* and *Zymomonas mobilis* was used to develop a suitable co-culture system. Kans grass biomass was hydrolyzed to give two separate sugar fractions (xylose rich and glucose rich fractions). *Candida shehatae* culture and respective xylose rich fermentation media were fed to the bioreactor; after exhaustion of xylose sugar, *Zymomonas mobilis* culture and respective media were fed to the same vessel. The strategy has been applied using both synthetic fermentation media and kans grass hydrolysate media to compare the kinetic parameters. Microaerobic condition for *Candida shehatae* and strictly anaerobic condition for *Zymomonas mobilis* fermentation were found significant. 91.83% xylose and 96.32% glucose sugars were utilized to produce 25 g/L of ethanol using 60.15 g/L initial sugar concentration (40.32 g/L glucose+19.83 g/L xylose). Upon increasing initial sugar concentration (100.25 g/L glucose+59.74 g/L xylose), 93.28% xylose and 95.44% glucose sugars were utilized to produce 67.28 g/L ethanol from kans grass biomass hydrolysate; thereby achieving 82.45% of theoretical yield. Values of most of the fermentation parameters were lower in hydrolysate media compared to synthetic media. Overall ethanol yield coefficient ($Y_{P/S}$, g/g) has been observed as 0.44.

References

1. Archana Mishra and Sanjoy Ghosh (2016) Key pretreatment technologies for an efficient bioethanol production from lignocellulosics. *Advances in Biofeedstocks and Biofuels;* 1: 55-83.
2. Archana Mishra and Sanjoy Ghosh (2016) A perspective on current technologies used for bioethanol production from lignocellulosics. *Advances in Biofeedstocks and Biofuels;* 2: 25-66

Biography

Archana Mishra is currently pursuing her PhD from Indian Institute of Technology, India. She is working in second generation bioethanol production from various agricultural residues. She has completed her MTech degree from IIT Roorkee, India and BTech in Biotechnology from SRM University, India. She has published few book chapters and research articles in the field of bioethanol production, some manuscripts are under review in referred journals.

archiesrm@gmail.com