Samudrala Prashant Jeevan Kumar et al., J Fundam Renewable Energy Appl 2018, Volume 8
DOI: 10.4172/2090-4541-C4-059

11th World Bioenergy Congress and Expo

July 02-04, 2018 | Berlin, Germany

Biodiesel production from enzymatically delignified lignocellulosic substrates using oleaginous yeast *Trichosporon* sp

Samudrala Prashant Jeevan Kumar and **Rintu Banerjee**
Indian Institute of Technology, India

The dramatic increase in demand for transportation fuels coupled with depletion of finite resources and the increased environmental concerns have kindled to search for renewable fuels. Among several renewable fuels, biodiesel is a promising fuel, which is synthesized by transesterification reaction of vegetable oils/animal fats using methanol. On the other hand, exorbitant cost of vegetable oils and succinct supply of animal fats have crippled the development of biodiesel. Oleaginous yeast has the potential to synthesize lipid in significant amounts using lignocellulosic substrates. In the present study, Trichosporon sp. an oleaginous yeast was isolated, identified and evaluated its efficiency to utilize various lignocellulosic substrates that are delignified with laccase. It was observed that 21.45 %(w/w), 20.23 %, 18.82 %, 15.75 %, and 14.80 % of lipid contents were resulted with delignified Ricinus communis, cotton stalk, Lantana camara, Saccharum spontaneum and pineapple leaf waste, respectively. Further, the lipids were subjected to enzymatic transesterification using immobilized lipase and obtained yield of 85.00 % fatty acid methyl esters with oil:methanol ratio 1:15, 10 U of immobilized lipase/g of oil in 36 h at 30 °C of 150 rpm. The fatty acid methyl esters were tested for suitability of fuel properties and found that the iodine value, cetane index, saponification value, acid value and calorific value were within the limits of international standards. These studies signify that the delignified substrates could be used for biodiesel production by oleaginous yeast.

Recent Publications:

1. S.P. Jeevan Kumar, R. Banerjee (2013) Optimization of lipid enriched biomass production from oleaginous fungus using response surface methodology. Indian J Exp Biol 51: 979-983.
2. Jeevan Kumar SP, Garlapati VK, Dash A, Scholz P, Banerjee R (2017) Sustainable green solvents and techniques for lipid extraction from microalgae: A review. Algal Res 21: 138–147.
3. Kumar SPJ., Prasad SR, Banerjee R, Agarwal DK, Kulkarni KS, Ramesh KV (2017) Green solvents and technologies for oil extraction from oilseeds. Chem Cent J 11: 9.
4. Kumari A, Mahapatra P, Garlapati VK, Banerjee R (2009) Enzymatic transesterification of Jatropha oil. Biotechnol Biofuels 2 (1): 1.
5. Garlapati VK, Banerjee R (2010) Evolutionary and swarm intelligence-based approaches for optimization of lipase extraction from fermented broth. Eng Life Sci 10(3): 265-273.

Biography

S.P. Jeevan Kumar is pursuing his Ph.D. His research interests are biodiesel production from oleaginous microbes

jeevanicar@gmail.com