allied academies

7th International Conference on
GREEN CHEMISTRY & TECHNOLOGY

June 18-20, 2018 | Dublin, Ireland

J Ind Environ Chem 2018, Volume 2 | DOI: 10.4066/2591-7331-C1-003

BIOREFINERY OF WILD CASTOR SEED FOR SYNTHESIS OF GREEN PRODUCTS

Satya Narayan Naik, Subhalaxmi Pradhan, Bhushan Dole and **Devesh Saxena**
Centre for Rural Development and Technology, Indian Institute of Technology, New Delhi

Biorefinery is a concept of utilization of bio-based materials in an integrated manner to develop different products from the by-product of one process that can be the feedstock for other. This process is capable of providing a variety of products of various industrial applications from biomass. This paper deals with biorefinery approach of Non-edible oil seed crop Castor to produce different green materials. Castor seed is rich source of oil and due to high viscosity the oil is mainly used for biolubricant production. But the transesterified oil can be better adopted as biolubricantand biodiesel. Castor oil alkyl esters are produced directly for castor seed by reactive extraction (RE). Reactive extraction is both extraction and transesterification of vegetable oil directly from raw agricultural material. Reactive extraction of castor seed was carried out using different alcohols acting as both extracting solvent and transesterification reagent. It was found that the yield of reactive extraction is low in higher alcohols due to decrease in oil extraction efficiency. During RE process measurable amount of cake and glycerol is produced as a by-product. The seed cake is rich in protein and carbohydrates which can be used for bioethanol production and that alcohol will be again utilized in transesterification. Bio-enzymes can be produced by solid state fermentation of cakes. The glycerol obtained during this process is converted to monoglycerides by Glycerolysis reaction. Monoglycerides synthesised by this process can be used as biosurfactants. Utilization of theses by-products to value added product will reduce the cost of biodiesel/biolubricant production. So Non-edible oil based biorefinery can be set for production of Biofuels (Bioethanol, Biodiesel) and Bio-products (Biosurfactants, Biolubricants, Bio-enzymes) from Castor seed. So this process will develop a biorefinery technology for production of different green products from castor seed.