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Extraction and characterization of oil from non-edible seed *Prosopis juliflora*

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ABSTRACT

Non-edible oils which are known as the second generation feedstocks can be considered as potential substitutions for conventional edible food crops for the production of biodiesel. The use of non-edible plant oils is very significant because of the tremendous demand for edible oils as a food source. In this study, the optimum operating conditions for *Prosopis juliflora* oil extraction was studied using soxhlet apparatus technique. Five different solvent systems such as hexane, chloroform, methanol, isopropanol and dichloromethane were used for the extraction of oil. From the solvent systems studies chloroform: hexane was found to be suitable for the extraction of oil from the biomass. The maximum yield of oil extraction 29.5 % was obtained from 75 g of biomass. Different variables were investigated particle size, solvent to solid ratio, extraction time, moisture content and extraction temperatures. Results obtained showed that higher rates of extraction were obtained at a temperature of 80 °C. The ratio of solvent to solid ratio was found to be 6:1 gave higher extraction of oil. The optimum conditions were found at 180 mins of extraction time, 5 % moisture content and with particle size of 0.15 mm. The obtained *Prosopis juliflora* oil was characterized using FTIR analysis. From this analysis the presence of methyl groups, indicating the presence of fatty acids present in the oil that can be used for the biodiesel production. The Fatty acid profile of the optimized oil was characterized using Gas Chromatography Mass Spectroscopy (GC-MS) analysis. The saturated fatty acid (SFAs) was found to be very high of 80.5 % when compared to the unsaturated fatty acids 19.5 %.

Key words: Solvent Extraction, Extraction Variables, Process Optimization, Oil extraction and Fatty acid compositions.