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A critical evaluation of oil extraction from non-edible seed *Guazumaulmifolia* and their characterization

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ABSTRACT

Due to the concern on the availability of recoverable fossil fuel reserves and the environmental efforts caused by the use those fossil fuels, substantial attention has been given to biodiesel production as an alternative to petrodiesel. In this present study, optimization of oil extraction from *Guazumaulmifolia* seed was studied using soxhlet apparatus method. The effect of various parameters such as type of solvent, moisture content, particle size, temperature, time, volume of solvent-to-solid ratio was investigated to optimize the processing conditions for achieving maximum yield of oil extraction. Different solvent system such as chloroform, hexane, methanol, isopropanol, Dichloromethane, Chloroform: Hexane (1:1) ratio was used for the extraction of oil. From the solvent study system Chloroform: Hexane (1:1) was found to be the best solvent for the process when compared to other solvents used for the extraction. Optimum yield of 49.90% was predicted at extraction temperature of 60 °C and moisture content was found to be 5 %.The ratio of solvent-to-solid ratio found to be 6:1 gave higher extraction. Moreover, extraction time was optimized and had been optimized to 180 mins.Finally, the particle size was found to be 0.12 mm for the extraction of oil from *Guazumaulmifolia* seeds. The oil yield was increased with increase in temperature, time and volume of solvent but decreased with increase in seed particle size from 0.60 mm to 0.12 mm. The *Guazumaulmifolia* oil was characterized using Fourier Transform Infrared spectroscopy (FTIR) analysis. From this analysis aromatic groups indicating the presence of higher fatty acid ester present in the non-edible oil that can be used for the biodiesel production. The fatty acid profile of the optimized *Guazumaulmifolia* oil was analyzed using Gas Chromatography Mass Spectroscopy (GC-MS) analysis. The saturated fatty acid (SFAs) was found to be very high of 74.78 % when compared to the unsaturated fatty acids 25.22 %. Experimental analysis showed that oil is not edible but it has the great potential to be used as a feedstock for biodiesel production.

Key words: *Guazuma ulmifolia* Non-edible seed, Oil Extraction, FTIR and GC-MS.