



ANALYSIS OF THE CRUDE OIL EXTRACTION PROCESS FROM *MADHUCA*

INDICA

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ABSTRACT

Mahua oil is a critical source for meeting India's current energy demand. The mahua seed kernels were used to extract the crude oil by Soxhlet extraction with n-Hexane (65-70 °C), pressing with screw-press oil expeller and the combined method (pressing + solvent extraction). The total crude oil extracted from the seed kernel using the Soxhlet extraction method (with n Hexane) was 51%.The soxhlet extraction method is reported a remarkable method in present study .

Key Words: Mahua oil, Soxhlet extraction method, crude oil

INTRODUCTION

The current energy demand of India is manly depend on fossils fuels like oil, coal and petroleum products. India ranks 2nd in terms of consumption of energy in Asia and 4th in world i.e. 4.7 % of the total world's commercial energy. The vegetable oil of Plant *Madhuca Indica* is a very important source in current energy demand (

Meena, Tak, Nukani, 2015). Xu H, Miao X, Wu Q. (2006) and Sabariswaran,(2014) reported that In India, the main biodiesel commodity sources are Mahua (*Madhuca Indica*),

Sal (*Shorea robusta*), Neem (*Azadirachta indica*), Karanja (*Pongamia pinnata*), Kusum (*Schleichera deosa*), and Ratanjyot (*Jatropha curcus*). The oil extraction process is crucial step in production of Biodiesel production from non edible vegetable oils.

MATERIALS AND METHODS

Collection of Seeds and Extraction of Oil from Mahua (*Madhuca Indica*) Seeds

Madhuca indica is a tree grown in south districts of Rajasthan, India. The fresh seeds were purchased from the local villagers. All the seeds used for the study were obtained from a single plant. These seeds were cleaned and separated from the dust, stone, immature and infected seeds. Fruits were dried in oven at about 50°C temperature. Seeds with seed coat were grounded with the help of grinder. The powdered seeds were subjected to Soxhlet extraction using n-hexane as solvent Oil extraction was performed using 3 methods. They were Soxhlet extraction with n-Hexane (65-70 °C), pressing with screw-press oil expeller and the combined method (pressing + solvent extraction). The oil yield from each method was calculated as follows

Soxhlet method

$$\% \text{ Crude oil content in the sample} = \frac{X-F}{W} \times 100$$

X - Weight of the flask with oil and chips

F - Weight of the flask and the chips

W - Weight of the kernels

Pressing method

$$\% \text{ Crude oil content in the sample} = \frac{X}{W} \times 100$$

X - Weight of the oil

W - Weight of the kernels

RESULTS AND DISCUSSION

The total crude oil extracted from the seed kernel using the Soxhlet extraction method (with n Hexane) was 51%. The pressing method produced 25% (w/w) oil. The combined method produced a 42 percent yield. The solvent extraction method produced the most oil of the three methods, indicating that it is the most efficient method when compared to the other two. The significant amount of oil (51 percent by solvent extraction) indicates that *Madhuca indica* seed is an oil-rich source. The present study also supported by various author like Atabani AE, Silitonga AS, Ong HC, et al. (2013) , Knothe G (2010) and Kannahi M, Arulmozhi R (2013).

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