

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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PROJECT WORK REPORT

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“INVESTIGATIONS ON EFFECTS OF MICROWAVE PRETREATMENT ON YIELD AND QUALITY OF RUBBER SEED OIL FOR BIO-DIESEL ACTIVITIES”

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**BACHELOR OF ENGINEERING
IN
CHEMICAL ENGINEERING**

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ABSTRACT

Oil seeds not only are reservoirs of oils & fats, but are also good sources of proteins, carbohydrates & pigments which are good sources of animal feed stocks. Good oil and fat recovery procedures produce undamaged oils free from others, obtaining as much yield as possible, and producing low-fat residues (meals) of high economic value. Most Oilseeds usually have oil encased in minute “glands” which are deeply embedded inside fibrous structures. Pretreatments change the morphological structure of oil seeds and increases oil extraction rates & yields. Oil seeds, therefore, require some kind of mechanical treatment and conditioning sometimes cooking and drying, which help to release the oil. Pretreatment steps are not universal but tailor made to specific variety of seed used.

Favorable agro-climatic conditions, Union Governments incentives for rubber cultivation have attracted people’s attention to go for rubber plantations which have become centers of prosperity across tribal population of South West & North East regions of India. Although, latex is main important product, yet the prospects of the seeds is high because of the oil contained in it. In spite of their rich oil content rubber seeds are simply burnt as wood substitute at present. Present work is an effort to demonstrate how high quality oil from pretreated rubber seeds can be produced in appreciable yields.

Rubber fruits were collected from Rubber plantations located at Kulasekharam town of Kanyakumari district and analyzed for their moisture contents. They were dehulled to separate hulls. Kernels were ground and screened. Using Soxlet extractor rubber seed oil was separated. Color and free fatty acid (FFA) content of oil was determined.

A portion of seeds collected were dried in a through recirculation dryer available in the department. Dried seeds were solvent extracted color and FFA of oil samples was determined. Oil yields of dried seeds were found to be higher but oil was of low quality indicating that thermal treatment improves oil yields. A literature search revealed temperature (T) and time of exposure (τ) of oil seeds kernels influence quality and quantity of oils. Microwave pretreatment is reported to have advantages over conventional methods. A readily available microwave oven is used and experiments are conducted for various power ratings and durations. Yield and quality of oil produced are determined and reported. Biodiesel from rubber seed is produced by transesterification with methanol. Results of studies obtained are presented and discussed.