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Design of a jatropha oil extractor for domestic use

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Jatropha Curcas seed has been recognized as a suitable seed for oil extraction, which has added advantages such as rapid growth, higher seed productivity, suitable for tropical and subtropical regions of the world. It can grow almost on any type of soil whether gravelly, sandy or saline and thrives even on the poorest stony soils and rock crevices. Considering the above facts, the project “Design and Development of a Jatropha oil Extractor for Domestic Use” was carried out at the Department of Mechanical and Manufacturing of Engineering, Faculty of Engineering, University of Ruhuna.

Existing coconut oil and Jatropha oil extractors were studied and tested the oil yield of existing Jatropha oil extractor in Thanamalwila area. Average oil yield of existing machine was founded to be 17.67% (Weight basis). Two extractors were designed to maximize the oil yield (about 26%). In the primary oil extractor two helical gear profiles were used to press and squeeze the Jatropha seeds to maximize the oil yield rather than only pressing. The secondary oil extractor was designed for further oil extraction from the cake which is more similar to the existing oil extractor. Design calculations were done for the gear profile, bearings and shaft in the primary extractor. Designed oil extractor could be improved by introducing electrical motor for mass scale oil production. Oil yield could be further improved by varying the particle size and moisture content of Jatropha seeds.

Jatropha oil has substantial prospects such as long-term substitute for diesel fuels, soap production, direct use in cooking stoves and oil lamps (replacing kerosene oil lamps) and Jatropha seedcake could be used for producing bio gas and fertilizer.

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