

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM



PROJECT WORK REPORT ON
“PRODUCTION, CHARACTERIZATION OF BIODIESEL FROM PUPAE A
BYPRODUCT OF SILK REELING INDUSTRY AND ENGINE PERFORMANCE
ANALYSIS AND EMISSION CHARACTERISTICS OF CRDI DIESEL ENGINE”

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ABSTRACT

Bombyx mori silk is a fine quality silk obtained from the silkworms reared on castor leaves. It comprises of about 75% of the total silk produced in India. It is produced as almost a household activity in certain parts of southern India. The sericulture activities generate huge quantities of the waste silkworm pupae after production of the silk from cocoons. The dumping of this huge waste poses a threat to the environment of the locality. Recent studies have shown that these waste pupae contain 35% or more lipids (Oil). The lipid part of the waste Bombyx mori silkworm pupae can be transesterified with methanol to produce methyl esters (Bio-Diesel) of fatty acids. The present work reports a quick and efficient Tansesterification method to convert the lipid to fatty acid methyl ester (Bio-Diesel). The physicochemical properties of the methyl ester (Bio-Diesel) are reported. The parameters fulfill the international requirement for biodiesel. Thus the present work shows that this bio-waste can be converted to good quality fuels which may be used as biodiesel additives.

Biodiesel is considered one of most promising alternate fuels to diesel fuels. The objective of the work is to fabrication of Soxhlet Extractor, oil extraction and evaluation of both physical and chemical properties and production of Biodiesel, evaluation of different property and blend with conventional diesel. The analysis the engine performances, emission characteristics using common rail direct injection (CRDI) diesel engine is run on Biodiesel-blended diesel fuels. The engine performance under a Biodiesel-blended diesel fuel was similar to that under diesel fuel, and the high fuel consumption was due to the lowered calorific value that ensued from mixing with Biodiesel. The use of biodiesel-diesel blended fuel reduced the hydrocarbon (HC) and carbon monoxide (CO) emissions but increased nitrogen oxide (NO_x) and smoke opacity emission due to the increased oxygen content in the fuel.