



Performance and emission analysis of Karanja oil blends with additive in diesel engine

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Abstract— The expanding vitality request in our everyday life causes consumption of accessible diesel. The readied test powers are utilized as a part of single chamber water cooled diesel motor at different load conditions to assess the execution and outflow parameters of the motor. At long last karanja oil 15-20%blends of karanja oil with methanol alongside 80-85% diesel are utilized as a fuel and the motor execution and emanation qualities will be broke down.

Key words: Karanja oil, Diesel, Methanol, Single cylinder diesel engine

I.INTRODUCTION

Biodiesel is a sustainable, ensured and non-dirtying wellspring of vitality to nature made from vegetables and creature fats that can be utilized as a part of diesel motor. Vitality is the most basic necessity for human presence. Biodiesel is increasing more noteworthiness as an elective fuel because of the lessening of oil assets and the cost move of oil products. The greater part of the investigates did execution and outflow trial of biodiesel motor. Use of petroleum derivatives has profoundly expanded and the utilization of these vitality assets has principle condition affect also.

Nature panama piñata trees confront 50-feet high and their thick shade can be similarly wide. They brandish generous, dim green leaves that hold dampness even under extraordinary warmth. Little groups of white,

purple, and pink blooms bloom on their branches consistently, developing into dark colored seed units that litter the ground. At the point when the seed units are squeezed, the oil that is removed can be utilized as bio fuel to control pumps, generators, and even substantial apparatus like tractors, autos, and trucks.

The upsides of biodiesel over diesel fuel are higher ignition productivity higher cetane number and less carbon monoxide discharge. Alongside the characteristic preferences of biodiesel the inconveniences of utilizing biodiesel merit saying. The impediments of biodiesel incorporate somewhat higher NO_x emission,cold begin problem,lower vitality content,higher copper strip consumption and fuel pumping trouble coming about because of higher viscosity.currently,biodiesel is costly to deliver than diesel.which gives off an impression of being the essential factor in keeping its more across the board utilize .current overall generation of vegetable oil and creature fat isn't sufficient to supplant fluid non-renewable energy source use.These reasons offered ascend to the expanding significance of mixes of different energizes like diesel fuel,bio-ethanal etc.with biodiesel

II. LITERATURE REVIEW

[1]Pratik H.Rathod et al (2015) studied that one of the alternatives is ether. In this experimental analysis there is a study of methanol (DEE) and Ter-amly ethyl

ether(TAEE) when blended with diesel fuel and its comparison with conventional diesel fuel. There is comprehensive analysis on combustion characteristics such as cylinder pressure heat release and performance characteristics specific fuel consumption and break thermal efficiency are carried out in the analysis 5%,10%,15% ether s was blended with diesel which is compared with the conventional diesel

[2] Dyed Tessa et al (2014) analyzed in detail for application in weight start (CI) engines achieving stimulating potential opportunities to assemble imperativeness security and reduce gas releases. Bio diesel is one of the elective empowers which is economical and environmentally neighborly and can be used as a piece of diesel engines with essentially zero alterations. The target of the examination is to research the impacts of bio diesel writes and bio diesel portion on the discharge qualities of a CI motor. The trial work was done on four barrel, four strokes, coordinate infusion (DI) and turbo charged diesel motor by utilizing bio diesel produced using waste oil, rapeseed oil, corn oil and contrasting them with ordinary diesel. The powers utilized as a part of the investigations are B10, B20, B50, B100 and slick diesel. The motor was worked over a scope of motor rates. In view of the deliberate parameters, itemized investigations were done on major controlled outflows, for example, NO_x, CO, CO₂, and THC. It has been seen that the bio diesel composes (sources) don't bring about any huge contrasts in emanations.

[3] Sandip S. jawre et al (2016) this paper explored about Di-ethyl Ether (DEE) as oxygenated added substances blended with diesel-bio diesel mixes and looks at its impact on execution and fumes gas emanation of pressure start motor.

[4] AR. Manickam a, K.Rajan et al (2014) considered the usage of Di-ethyl Ether (DEE) as an oxygenated included substance with 20% karanja methyl ester diesel blend (B20). Tests were directed to consider the effect of including 5%, 10% and 15%, Di-ethyl ester (DEE) with karanja Methyl Ester (KME) on execution, transmission and start characteristics of a prompt imbue ment diesel engine worked at a relentless speed of 1500 rpm at different working conditions. The results exhibited that the brake warm profitability insignificantly extended and exhaust radiations are on a

very basic level lessened with DEE with bio diesel at full load conditions.

2.1 SUMMARY OF THE LITERATURE REVIEW

- The literature review revealed that many number of research were done on alternative fuels. Some of the alternative fuels are karanja oil, jatropha oil, neem oil, palm oil, coconut oil, cotton seed oil, etc.
- From the above mentioned alternative fuels, the karanja oil is found to be a suitable biodiesel, because physical and chemical properties of karanja oil are similar to those of diesel. Availability of karanja oil in India is more.
- Biodiesel produced from karanja oil is used effectively in diesel engine, because it reduces emission like carbon monoxide, carbon dioxide and nitrogen oxide.
- The karanja oil is majorly used in the stationary engine for experimental analysis of performance and emissions characteristics at constant compression ratio.
- In this project an attempt is made to study the performance and emission characteristics of karanja oil as an alternative fuel in variable in variable injection pressure with additives.

III .MATERIAL AND METHODS

Experimental Test and Instrumentation

TABLE I: Technical Specification of VCR engine

Make	Kirloskar
General details	4- Stroke, water cooled, variable Compression ratio Engine.
Rated power	3.5Kw at 1500rpm Experimental Test and Instrumentation TABLE I. Technical Specification of VCR engine
Speed	1500 rpm (constant)

No of cylinder	Single cylinder
Compression ratio	12:1 to 18:1
Bore	87.5 mm
Stroke	110 mm
Ignition	Compression ignition

1. Experimental Setup

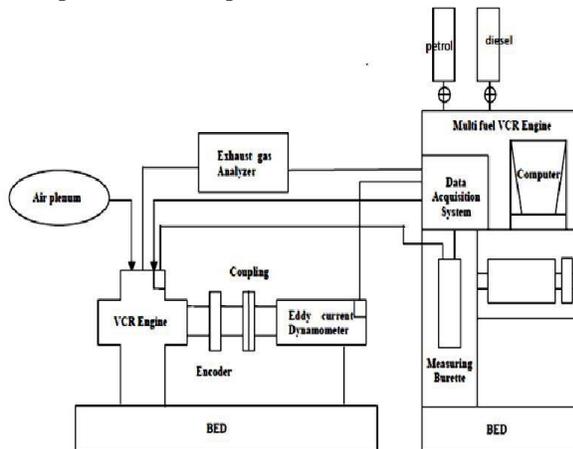


Fig.1 Experimental setup

A. Preparation of Biodiesel Blends

Biodiesel mix is only blending of pongai oil or bio diesel with standard diesel at some measure of rate. Presently in this analysis we are utilizing biodiesel mix called B20 (20% of biodiesel and 80% of standard diesel) is utilized to run the motor. At that point methanol (added substance) is included. Methanol is included with biodiesel mix (B20) in the level of 5%, 10%. The different mix extents are Diesel, B20D80M0, B20D80M5, and B20D80M10.

Table 2: Fuel Nomenclature

B20D80	20% Biodiesel + 80% Diesel
B20D80M5	20% Biodiesel + 80% Diesel + 5% Methanol
B20D80M10	20% Biodiesel + 80% Diesel + 10% Methanol

IV. RESULTS AND DISCUSSIONS

A. Experimental Results

The Carbon monoxide discharge esteems for Diesel, B20D80, B20D80M5, and B20D80M10 are assessed with help of different burdens like 0%, 25%, half, 75% and 100%. The outcome finished up from this Fig.2 is carbon monoxide diminishes 5% with help of increment in loads when B20D80M5 is utilized as a bio fuel.

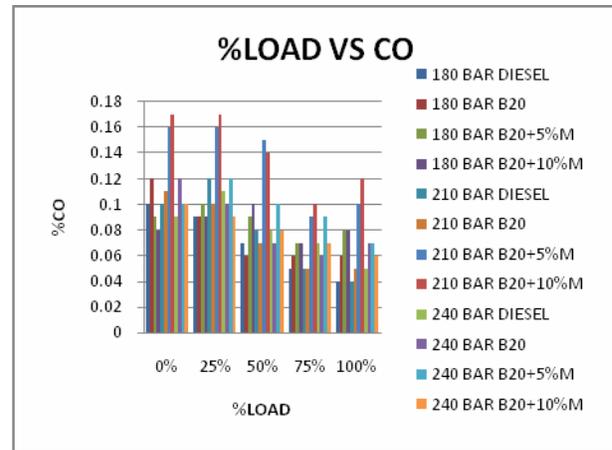


Fig.2 Variation of CO with load

The Hydro carbon outflow esteems for Diesel, B20D80, B20D80M5, and B20D80M10 are assessed with help of different burdens like 0%, 25%, half, 75% and 100%. The outcome finished up from this Fig.3 is hydro-carbon decreases 3% with help of increment in loads when B20D80M5 is utilized as a bio-fuel in the motor.

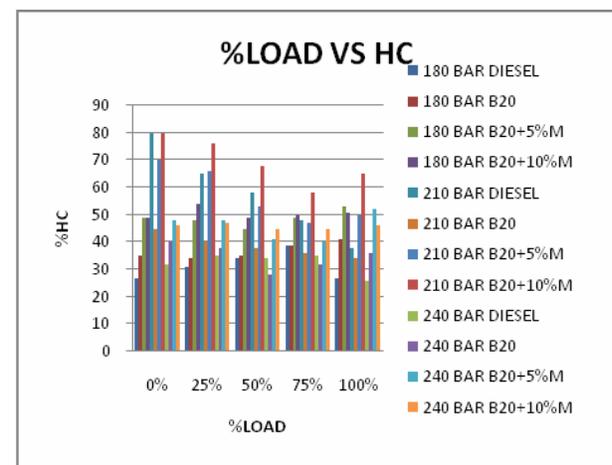


Fig.3 Variation of HC with load

The NOX outflow esteems for Diesel, B20D80, B20D80M5, and B20D80M10 are assessed with help of

different burdens like 0%, 25%, half, 75% and 100%. The outcome closed from this fig.5 is nitrous oxide diminishes with 3% with help of increment in loads when the mix B20D80M5 in weight motor.

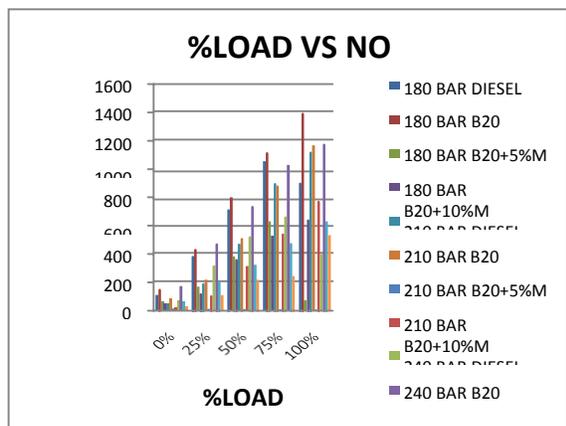


Fig.4 Variation of NO_x with load

The CO₂ outflow esteems for diesel, B20D80, B20D80M5, and B20D80M10 are assessed with help of different burdens like 0%, 25%, half, 75%, and 100%. The outcome closed from this fig.5 is carbon dioxide diminishes with 3% with help of increment in loads when the mix B20D80M5 in weight motor.

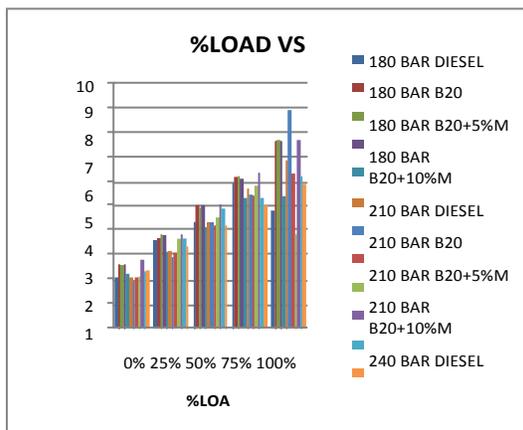


Fig.5 variation of CO₂ with load

The O₂ outflow esteems for Diesel, B20D80, B20D80M5, and B20D80M10 are assessed with help of different burdens like 0%, 25%, half, 75% and 100%. The outcome closed from this fig.5 is oxygen increments with 3% with help of increment in loads when the mix B20D80M5 in weight motor.

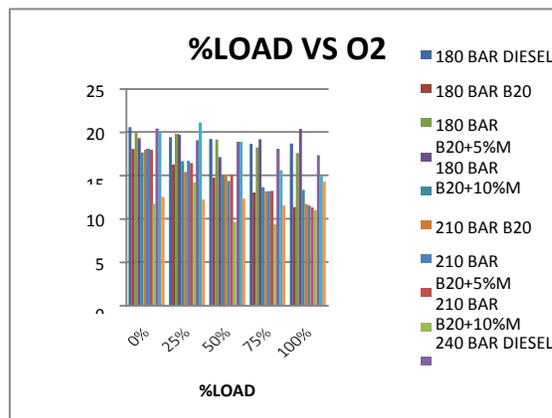


Fig.6 variation of O₂ with loads.

The O₂ discharge esteems for Diesel, B20D80, B20D80M5, and B20D80M10 are assessed with help of different burdens like 0%, 25%, half, 75% and 100%. The outcome finished up from this fig.5 is oxygen increments with 3% with help of increment in loads when the mix B20D80M5 in weight motor

V.CONCLUSION

The execution and spread traits of a variable weight extent engine invigorated with Biodiesel blends have been investigated and differentiated and the standard diesel. The going with conclusions are drawn from this examination Carbon - monoxide surges decreases 5% when the blend B20D80M5 is used as a fuel ceaseless Injection weight engine with evolving loads. Hydrocarbon radiations reduce 3% when the blend B20D80M5 is used as a fuel in factor Injection engine with moving weights. Nitrous oxide lessens with 3% with help of addition in loads when the blend B20D80M5 in weight engine. Carbon dioxide lessens with 3% with help of augmentation in loads when the blend B20D80M5 in weight engine.

VI.REFERENCES

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