

Combustion, performances and emissions characteristics of black soldier fly larvae oil and diesel blends in compression ignition engine

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ABSTRACT

In this study, insect biofuel from black soldier fly larvae (BSFL) oil was investigated as a potential alternative fuel in a single cylinder direct injection compression ignition (CI) engine. The neat of BSFL oil and its blends (B25, B50, B75, and B100) were utilized in the engine, in order to identify its combustion, performance, and emission characteristics. This was followed by an experimental performance at a constant speed with variable engine loads. The result showed a slight decrease by 3.28% in the cylinder pressure, with an 8.21% reduction in brake thermal efficiency; while an increment in the brake specific fuel consumption was noticed. Furthermore, there was a decreasing trend of about 19.62% and 1.84% in NO_x and O₂ respectively. Nevertheless, an increase in CO, CO₂, HC, and exhaust gas temperature was also discovered. It could be concluded that, the BSFL oil possesses a high potential to be utilized as an alternative fuel for CI engines in the future.

KEYWORDS

Engine performance; Combustion; Exhaust emission; Biofuel; Insect oil

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