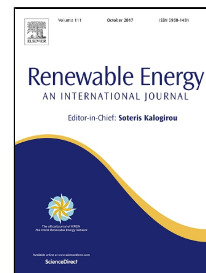


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A renewable lipid source for biolubricant feedstock oil from housefly (*Musca domestica*) larva

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1 A renewable lipid source for biolubricant feedstock oil from housefly (*Musca*
2 *domestica*) larva

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14 **Abstract:** Biolubricants are gaining increased attention because of their low toxicity, high
15 biodegradability, and miscibility with additives. These features render them ideal for lubrication,
16 especially in total-loss processes. In this study, housefly (*Musca domestica*) larvae were used as low-
17 cost, non-food biolubricant feedstock. A larval lipid with high acid value (AV) of 63 mg KOH/g was
18 used as feedstock for esterification to produce 2-ethylhexyl fatty acid esters (2-EH esters). We
19 developed a method of producing high-purity 2-EH esters in which housefly larva free fatty acids
20 (HLFFAs) were derived from larvae fed with kitchen waste. HLFFAs were esterified with 2-ethyl-1-
21 hexanol (2-EHOH) catalysed with benzenesulfonic acid (BSA). The optimum esterification conditions
22 were as follows: catalyst loading, 0.5 wt.%; 2-EHOH-to-HLFFAs molar ratio, 3:1; temperature,
23 130 °C; and reaction time, 2 h. These conditions yielded 98.6% esterification rate. Excess 2-EHOH was

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