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Abstract	:	<p>This study explores the synthesis of biolubricants from fatty acid methyl ester (FAME) utilizing synthetic organic compound namely propylene glycol (PG) as a substrate. Through percentage of conversion, the synthesis of propylene glycol diester (PGD) is identified. Due of its edible nature and low toxicity, PG was selected to replace trimethylolpropane (TMP) as the substrate base. The investigated reaction parameters included reaction temperature (140-180 °C), catalyst loading (0.1-0.5 wt %), PG to FAME ratio (1:2-6), and time (2-8 hours). Through the determination of PG to PGD conversion, the ideal reaction parameters have been examined. To evaluate the toxicity of the PGD, a toxicology test was done using brine shrimp. At a temperature of 160 oC, with a PG:FAME molar ratio of 1:6 and a reaction duration of 8 hours, the ideal conditions for the synthesis of biolubricant with the maximum PGD conversion (99 %) were determined. The minimal limit of toxicity for PGD exceeded that of petroleum-based lubricants. The research has been shown to be economically viable and beneficial. Therefore, the synthesis of PGD from PG has the propensity to substitute the conventional inedible biolubricant that is effectively applicable in the foreseeable future.</p>