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Bioactive Compounds of *Hibiscus sabdariffa* Seed and *Anacardium occidentale* Nut Shell as Potential Natural Antioxidants for Biodiesel

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Abstract

Fossil-fuel depletion and environmental pollution are two pressing issues leading to necessity focus on biodiesel as an alternative energy source. However, the oxidation stress of fatty acid methyl ester (FAME) is pivotal to be suppressed to keep biodiesel from deteriorating for longer storage. The solution come in handy by using antioxidants especially from renewable unused waste biomass. *Hibiscus sabdariffa* (Roselle) seed and *Anacardium occidentale* (Cashew) nutshells are common agriculture industry residues and normally left unconsumed. Antioxidation analysis done on both plant's part showed positive correlation of DPPH antioxidation assay with total phenolic compound with \(r = 0.9492\) and \(0.9709\) for cashew nut shell (methanol) and Roselle's seed (methanol) respectively. Profiling of both plant's part revealed that 3-pentadecyl phenol is abundant in cashew nut shell suggesting this compound is to be contributing to the antioxidation capability. Both plant's part did achieved IC\(_{50}\) in ABTS assays with 5.203±0.41 (cashew methanol), 5.233±0.37 (cashew hexane), 12.616±0.11 (roselle methanol) and 12.884±0.28 (roselle hexane). Whilst for DPPH assay only cashew methanol and roselle methanol achieved IC\(_{50}\) with 5.489±0.31 and 7.584±0.15 accordingly. The data obtained in this study is noteworthy to be further studied in Rancimat system for measuring oxidation stability.

Keywords: Antioxidants, ABTS, DPPH, TPC, GCMS

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