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Antioxidant activities of Dialium indum L. Fruit and gas chromatography-mass spectrometry (GC-MS) of the active fractions (Article) (Open Access)

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Abstract

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The fruit of Dialium indum L. (Fabaceae) is one of the edible wild fruits native to Southeast Asia. The mesocarp is consumed as sweets while the exocarp and seed are regarded as waste. This study aimed to evaluate the antioxidant activities of the fruit by using four assays, which measure its capabilities in reducing phosphomolybdic-phosphotungstic acid reagents, neocuproine, 2,2-diphenyl-picrylhydrazyl (DPPH), and inhibiting linoleic acid peroxidation. The active fractions were then analyzed by gas chromatography-mass spectrometry (GC-MS). The results showed that the seed methanol fraction (SMF) exhibited the strongest antioxidant activity with significantly higher ($p < 0.05$) gallic acid equivalence (GAE), total antioxidant capacity (TAC), and DPPH radical scavenging activity (IC_{50} 31.71; 0.88 µg/mL) than the other fractions. The exocarp dichloromethane fraction (EDF) was the discriminating fraction by having remarkable linoleic acid peroxidation inhibition (IC_{50} 121.43; 2.97 µg/mL). A total of thirty-eight metabolites were detected in derivatized EDF and SMF with distinctive classes of phenolics and amino acids, respectively. Bioautography-guided fractionation of EDF afforded five antioxidant-enriched subfractions with four other detected phenolics. The results revealed the antioxidant properties of D. indum fruit, which has potential benefits in pharmaceutical, nutraceutical, and cosmeceutical applications.

Author keywords

Amino acids | Antioxidant | Dialium indum | Exocarp | GC-MS analysis | Phenolic acids | Seed

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