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ANTIOXIDANT ACTIVITY AND TOTAL PHENOLIC CONTENT OF MEE (*Madhuca* sp.) OIL

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Mee oil, also known as Mahua oil extracted from the kernels of Mahua seeds (*Madhuca* species), is a highly unsaturated edible oil rich in monounsaturated fatty acids (MUFA). It is also rich in many bioactive compounds including phytosterols, sterol esters, triterpene alcohols, gamma-oryzanol, tocopherols, tocotrienols and other phenolic compounds. Furthermore, Mee oil is reported to have a high medicinal value. Minor components, especially antioxidative constituents, play an imperative role in nutrition and health. This study was carried out to determine the antioxidant activity and total phenolic content of oil extracted from Mee (*Madhuca* sp.) seed kernel which currently remains as an underutilized edible oil in Sri Lanka.

The phenolic fraction of the oil was extracted into methanol by passing the oil through a glass column containing silica (60 Å pore diameter). The Total Phenolic Content (TPC) was determined using the Folin-Ciocalteu's colorimetric method and expressed as mg of gallic acid equivalents (GAE) per gram of extract. The antioxidant potential of the oil extracts was assessed using 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radical scavenging assays and β -carotene/linoleate model system using α -tocopherol as the reference antioxidant. The dose dependant behavior of the extract towards DPPH and ABTS radicals was also determined by using varying quantities (0.1 – 0.5 g) of the extract.

Mee seed oil extracts possessed TPC of 13.00 ± 0.05 mg GAE/g extract. The DPPH radical scavenging activity expressed as IC_{50} value of the oil extract and α -tocopherol was 0.078 mg/mL and 0.031 mg/mL, respectively. Oil extracts showing an IC_{50} value of less than 1 mg/ mL are categorized as oils with considerably high antioxidant potential. The corresponding values for ABTS radical scavenging activity of Mee oil extract and β -carotene were 46.0% and 64.0%, respectively, at 2.0% (w/v) concentration. Mee seed oil extracts exhibited a slightly lower percentage of inhibition of linoleic acid induced oxidation of β -carotene (45.1%) compared to α -tocopherol (54.0%) at 2.0% (w/v) concentration. It was observed that the antioxidant efficacy of the extract as measured by DPPH and ABTS radical scavenging assays increased with the quantity of the extract confirming that compounds present in the extract contribute to the antioxidant activity of the oil. The results revealed that the Mee oil possesses a high antioxidant efficacy thus, it can be considered an edible oil with potential health benefits.

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