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**THE EFFECT OF COOKING METHODS ON TOTAL PHENOLIC AND
ANTIOXIDANT ACTIVITY OF SELECTED 'ULAM'**

By

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Degree of Bachelor of Food Science
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DECLARATION

I hereby declare that this research project is based on my original work except for quotations and citations which have been duly acknowledge. I also declare that it has not been previously or concurrently submitted for any degree at UMT or other institutions.

25th June 2007



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Approved by,

25th June 2007

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ABSTRACT

This study was conducted to evaluate the total phenolic and antioxidant activity of extracts from four species of 'ulam', namely *Psophocarpus tetraganobus* (winged bean/kacang botor); *Momordica subangulata* (bitter cucumber/peria katak); *Musa L. inflorescent* (jantung pisang) dan *Solanum tarvum Swartz* (devil's fig/terung pipit). There are five cooking methods were used in this study. There were fresh; blanching; boiling; microwave and steaming. Methanol was used as extracting solvent. The total phenolic were measured by Folin-Ciocaltue method while antioxidant activity were measured by 2,2,-diphenyl-2-picryl-hydrazyl (DPPH) method. The results of total phenolic were compared with gallic acid while antioxidant activities were compared with butylated hydroxytoulene or BHT (synthetic antioxidant). Total phenolic content of fresh 'ulam' ranged from 0.44 to 1.06 mg/100 g (as gallic acid equivalent). The total antioxidant activity of fresh 'ulam' ranged from 28.86 % to 36.01 %. In total phenolic content, microwaving method was seen to have the highest while boiling method was the lowest in total phenolic content. In DPPH method, steaming samples showed the highest antioxidant activity while blanching method was seen to have the lowest antioxidant activity. The highest total phenolic as gallic acid equivalent showed that devil's fig in microwave cooking method while the lowest was in *Musa L. inflorescent* in blanching method. The highest antioxidant activity showed in *Musa L. inflorescent* in boiling method while the lowest antioxidant activity was in winged bean in microwaving method. The results show that all samples contain very strong constituents regarding lipid peroxidation. The result of this study strongly showed that the extract of 'ulam' could be used as easily accessible source of natural antioxidant, functional food or in pharmaceutical industry.

KESAN PELBAGAI KAEDAH MEMASAK KE ATAS JUMLAH KANDUNGAN FENOLIK DAN AKTIVITI ANTIOKSIDAN DI ANTARA PELBAGAI JENIS ULAM-ULAMAN TERPILIH

ABSTRAK

Kajian ini dijalankan bertujuan untuk menentukan kandungan fenolik dan aktiviti antioksidan oleh ekstrak daripada empat spesies ulam-ulaman. Ulam-ulaman yang dikaji termasuklah *Psophocarpus tetraganobus* (kacang botor); *Momordica subangulata* (peria katak); *Musa L. inflorescent* (jantung pisang) dan *Solanum tarvum Swartz* (terung pipit). Kaedah memasak yang digunakan ialah lima jenis iaitu mentah (tanpa kaedah memasak); penceluran; pendidihan; gelombang mikro dan mengukus. Metanol telah digunakan sebagai pelarut pengekstrakan. Kandungan fenolik ditentukan menggunakan ujian Folin-Ciocalteu. Manakala antioksidan daripada metanol ekstrak ditentukan menggunakan kaedah 2,2,-diphenyl-2-picryl-hydrazyl (DPPH). Penentuan kandungan fenolik dibandingkan dengan gallic acid manakala aktiviti antioksidan dibandingkan dengan butylated hidroksiltolune atau BHT (antioksidan sintetik). Julat kandungan fenolik dalam ulam mentah adalah antara 0.44 kepada 1.06 mg/100 manakala bagi aktiviti pengoksidaan adalah antara 28.86 % hingga 36.01%. Bagi ujian kandungan fenolik, kaedah memasak secara gelombang ketuhar adalah paling tinggi nilai kandungan fenolik manakala kaedah pendidihan adalah paling sedikit. Bagi ujian DPPH pula, kaedah mengukus adalah paling tinggi manakala kaedah penceluran adalah paling rendah aktiviti pengoksidaan ke atas empat sampel ulam yang digunakan. Terung pipit (ketuhar gelombang) mengandungi paling tinggi kandungan fenolik manakala jantung pisang (pendidihan) adalah tinggi aktiviti pengoksidaan. Hasil kajian menunjukkan semua sampel mengandungi kandungan aktiviti antioksidan yang tinggi dalam mencegah pengoksidaan lipid. Hasil kajian ini jelas menunjukkan ekstrak daripada ulam-ulaman boleh digunakan dengan mudah sebagai antioksidan semulajadi dan berpotensi digunakan sebagai makanan berfungsi dan juga dalam industri farmaseutikal.