

**EFFECTS OF PRETREATMENTS ON LIPID OXIDATION
STABILITY OF HONEYDEW (*Cucumis melo*) SEED OIL**

By

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ENDORSEMENT

The project report entitled **Effects of Pretreatments on Lipid Oxidation Stability of Honeydew (*Cucumis melo*) Seed Oil** by **Chin Ai Chin**, Matric No. **UK 17449** has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Food Science in partial fulfillment of the requirement of the degree of Food Science (Food Service and Nutrition), Faculty of Agrotechnology and Food Science, University Malaysia Terengganu.




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DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

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ABSTRACT

The purpose of the present study was to explore the influence of different heat pretreatments on the chemical composition of honeydew seed oil and to extend our knowledge concerning on its oxidative stability. The honeydew seeds were treated with different heat pretreatments namely roasting (R) (20min at 200°C), steaming (S) (20min at 100°C), and microwave (M) (15min at 2450MHz). The honeydew seed oils from respective treated seeds were extracted by using a Bligh and Dyer method and the yields were found to be in the range of 17.22 – 21.59%. Fatty acid composition of the honeydew seed oils was examined by using gas chromatography and no significant difference was found among different pretreatments. Four types of major fatty acids of honeydew seed oils were palmitic acid (7.21 – 7.31%), stearic acid (4.14 – 4.33%), oleic (13.38 – 13.90%) and linoleic acid (73.83 – 74.47%). Meanwhile, the iodine value and free fatty acid content were determined by AOAC standard methods. The iodine values were found in the range of 133-135 g I₂/ 100 g. The free fatty acid content was in the range of 0.8 – 1.4% and it was found that among the different pretreatments, roasted seed oil showed the lowest value. Oxidative stability was determined by Schaal oven method in a condition of 60°C for duration of 12 days by monitoring the changes in peroxide value (PV) and para-anisidine value (AV). The roasted honeydew seed oil was found to demonstrate the best oxidative stability among the pretreatments applied.

ABSTRAK

Tujuan kajian ini adalah untuk meneroka pengaruh prarawatan haba yang berbeza pada komposisi kimia minyak tembikai susu dan meluaskan pengetahuan kita mengenai kestabilan oksidatif minyak berkenaan. Biji tembikai susu telah dirawat dengan prarawatan haba yang berbeza iaitu panggang (R) (20min pada 100°C), stim (S) (20min pada 100°C), dan gelombang micro (M) (15min pada 2450MHz). Minyak tembikai susu dengan prarawatan haba yang berbeza telah diekstrak dengan menggunakan kaedah Bligh dan Dyer dan didapati hasil minyak yang telah diekstrak adalah antara 17.22 – 21.59 %. Komposisi asid lemak untuk minyak tembikai susu tersebut ditentukan dengan menggunakan kromatografi gas dan keputusan mendapati tiada perbezaan yang signifikan antara prarawatan. Empat jenis asid lemak yang utama terkandung dalam minyak tembikai susu didapati adalah asid palmitik (7.21 – 7.31%), asid stearik (4.14 – 4.33%), asid oleik (13.38 – 13.90%) dan asid linoleik (73.83 – 74.47%). Sementara itu, nilai iodin dan kandungan asid lemak bebas ditentukan dengan kaedah standard AOAC. Nilai iodin didapati adalah antara 133-135 g I₂/ 100 g. Kandungan asid lemak bebas adalah antara 0.8 – 1.4% dengan prarawatan yang berbeza dan minyak dari biji yang dipanggang menunjukkan nilai yang paling rendah. Kestabilan oksidatif ditentukan dengan kaedah “Schaal Oven” pada suhu 60°C untuk 12 hari dengan pemantauan perubahan dalam nilai peroksida (PV) dan nilai p-anisidin (AV). Minyak dari biji yang dipanggang mempunyai kestabilan yang paling baik berbanding dengan minyak dengan prarawatan haba yang lain.