

COMPARISON OF ANTIOXIDANT ACTIVITY IN GREEN,
OOLONG AND BLACK TEA MADE FROM SELECTED HERBS
AND THEIR ACCEPTABILITY

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**COMPARISON OF ANTIOXIDANT ACTIVITY IN GREEN, OOLONG
AND BLACK TEA MADE FROM SELECTED HERBS AND THEIR
ACCEPTABILITY**

NOOR AZNIDA BINTI RAMLI

**RESEARCH PROJECT submitted in partial fulfillment of the requirements
for the Degree of Bachelor of Food Science
(Food Service and Nutrition)**

**FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
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DECLARATION

I hereby declare that this research project is based on my original work except for quotations and summaries that have been duly acknowledged.

15th June 2006



NOOR AZNIDA RAMLI
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15th June 2006

Approved by,



MOHAMAD KHAIRI MOHD ZAINOL
(Supervisor)

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ABSTRACT

This study was conducted to evaluate the antioxidative activity (AOA) of extracts from five species of herbal plant that processed to be green, oolong and black teas from their selective parts. These plant namely *Camellia sinensis* (teh), *Centella asiatica* (pegaga), *Mentha piperita* (pudina), *Chrysanthemum morifolium* (bunga kekwa), and *Cosmos caudatus* (ulam raja). Methanol used as extracting solvent. Total phenolic compounds in the extracts were measured using Follin-Ciocaltue Phenol Reagent method. These compounds have potential to become an active antioxidant. All samples tested have total phenolic compounds in different value. The kekwa green tea was consisted as the highest in total phenolic compounds and it has significant difference ($p < 0.05$) compared to pudina oolong tea, the lowest in total phenolic compounds among the samples. AOA of the methanol extracts measured using ferric thiocynate (FTC) method. The AOA then compared among the samples. The result revealed that the pegaga black tea was significantly ($p < 0.05$) higher than α -tocopherol (natural antioxidant). The pegaga black tea was significantly different ($p < 0.05$) with the true oolong tea, pudina oolong tea and true black tea. The acceptability of all herbal teas was determined using sensory evaluation. The hedonic scale was used in this sensory test. The result showed that the pudina oolong tea's color was the most acceptances among the herbal teas. The pudina oolong tea was significantly different ($p < 0.05$) compared to other samples except the true green tea and the true oolong tea. For the aroma attribute, ulam raja green tea was accepted by consumer as same as the true green tea and there were not significantly difference ($p < 0.05$) between both samples. The ulam raja oolong tea was the most acceptable herbal tea for the bitterness attribute and there were not significantly difference ($p < 0.05$) between this tea with the true black tea and oolong tea. The ulam raja oolong tea also got the highest mean score among the herbal teas which not significantly different ($p < 0.05$) compared to both true oolong and black teas for taste attribute. The ulam raja oolong tea was accepted by consumers among the herbal teas and there were not significantly different ($p < 0.05$) compared to both true oolong and black tea, which have more acceptance. The result of this study strongly show that all the herbal teas extract potentially have an active antioxidant and could be used as easily as healthy beverages, functional food, supplement or in pharmaceutical industry.

PERBANDINGAN AKTIVITI ANTIOKSIDAN DALAM TEH HIJAU, TEH OOLONG DAN TEH HITAM DARIPADA HERBA TERPILIH SERTA TAHAP PENERIMAANYA

ABSTRAK

Kajian ini dijalankan untuk menentukan aktiviti antioksidan (AOA) dalam ekstrak lima spesies tumbuhan herba yang telah diproses menjadi teh hijau, teh oolong dan teh hitam daripada bahagian-bahagian terpilih. Tumbuh-tumbuhan yang terlibat termasuklah *Camellia sinensis* (teh), *Centella asiatica* (pegaga), *Mentha piperita* (pudina), *Chrysanthemum morifolium* (bunga kekwa), dan *Cosmos caudatus* (ulam raja). Metanol telah digunakan sebagai pelarut pengekstrakan. Jumlah kandungan bahan fenolik dalam ekstrak ditentukan melalui kaedah Reagen Fenol Folin-Ciocalteu. Bahan ini berpotensi untuk menjadi antioksidan yang aktif. Semua sampel yang dikaji mempunyai jumlah kandungan bahan fenolik dalam jumlah yang berbeza. Teh hijau kekwa merupakan sampel yang paling tinggi jumlah kandungan bahan fenolik dan mempunyai perbezaan yang signifikan ($p < 0.05$) berbanding teh oolong pudina, sampel yang paling rendah jumlah kandungan bahan fenolik di antara kesemua sampel. AOA dalam ekstrak metanol dikaji menggunakan kaedah ferik thiosianat (FTC). AOA dibandingkan di antara semua sampel. Keputusan menunjukkan bahawa teh hitam pegaga tinggi secara signifikan ($p < 0.05$) berbanding α -tokoferol (antioksidan semulajadi). Teh hitam pegaga mempunyai perbezaan yang signifikan ($p < 0.05$) dengan teh oolong sebenar, teh oolong pudina dan teh hitam sebenar. Tahap penerimaan semua teh herba ditentukan melalui penilaian sensori. Skala hedonik telah digunakan dalam ujian sensori tersebut. Keputusan menunjukkan warna teh oolong pudina adalah yang paling diterima berbanding teh herba lain. Teh oolong pudina mempunyai perbezaan yang signifikan ($p < 0.05$) berbanding sampel lain kecuali teh hijau sebenar dan teh oolong sebenar. Bagi atribut bau, teh hijau ulam raja diterima oleh pengguna sama seperti teh hijau sebenar dan tiada perbezaan yang signifikan ($p < 0.05$) antara kedua-dua sampel tersebut. Teh herba yang paling diterima bagi atribut keamatan rasa pahit adalah teh oolong ulam raja dan tidak terdapat sebarang perbezaan yang signifikan ($p < 0.05$) dengan teh hitam dan teh oolong sebenar. Teh oolong ulam raja juga mendapat min skor tertinggi berbanding sample teh herba lain yang mana tidak terdapat sebarang perbezaan yang signifikan ($p < 0.05$) berbanding dengan teh oolong dan hitam sebenar bagi atribut rasa. Teh herba yang paling diterima oleh pengguna dalam penilaian sensori ini adalah teh oolong ulam raja dan tidak terdapat sebarang perbezaan yang signifikan ($p < 0.05$) berbanding teh oolong dan hitam sebenar, yang mana lebih diterima. Hasil kajian ini jelas menunjukkan bahawa semua ekstrak teh herba berpotensi mempunyai antioksidan yang aktif dan boleh digunakan semudah minuman kesihatan, makanan berfungsi, suplemen atau dalam industri farmaseutikal.