

EFFECT OF ANTI-BROWNING TREATMENTS ON
PHYSICOCHEMICAL CHARACTERISTICS AND
SENSORY ACCEPTANCE OF GREEN ROSELLE PICKLE
(*Hibiscus sabdariffa* L. var. UKMR-3)

By

Bernard Lai Kok Kit

Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Food Science (Food Technology)

DEPARTMENT OF FOOD SCIENCE
FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITI MALAYSIA TERENGGANU
2012

ENDORSEMENT

The project report entitled **Effect of Anti-browning Treatments on Physicochemical Characteristics and Sensory Acceptance of Green Roselle Pickle** by **BERNARD LAI KOK KIT**, Matric No. **UK17337** 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 Bachelor of Food Science (Food Technology), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.



(ZURAIDAH NASUTION)

Main Supervisor

-Official Stamp-

ZURAIDAH NASUTION
Pensyarah
Jabatan Sains Makanan
Fakulti Agroteknologi dan Sains Makanan
Universiti Malaysia Terengganu
21030 Kuala Terengganu.

Date: 18/6/2012



(ROSHITA IBRAHIM)

Co-supervisor

-Official Stamp-

ROSHITA IBRAHIM
Pensyarah
Jabatan Agroteknologi
Fakulti Agroteknologi dan Sains Makanan
Universiti Malaysia Terengganu

Date: 18/6/12

DECLARATION

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

Signature : *lin*

Name : Bernard Lai kok Kit

Matric No. : UK 17337

Date : 18/6/12

ACKNOWLEDGEMENT

The compilation and preparation of this final year project report would not have been possible without the support, hard work and endless efforts of a large number of individuals and institutions. I would like to express my deepest gratitude to my parents and my friend, Tan Bee Him for giving me the encouragement and support I needed in order to accomplish my project.

First of all, I would like to extend my heartfelt gratitude to my research project supervisors, Ms. Zuraidah Nasution and Ms. Roshita Ibrahim who gave me the possibility to complete this thesis. I am deeply indebted to them whose help, guidance and encouragement helped me in all the time of research and the writing of this thesis.

I also take this opportunity to convey my sincere thanks to all the lecturers in the Department of Food Science for their constructive suggestion and information during the final year project progress till it is fully completed. Great deals of appreciation go to the continuous commitment and contribution of the laboratory staffs throughout this research.

Last but not least, my special thanks to all of my friends and everyone, those who have contributed by supporting my work and helped me in this project. Above all, I am very much thankful to the Great God Almighty for carrying me through all the difficulties in the completion of this project.

ABSTRACT

The inhibition of enzymatic browning catalyzed by polyphenol oxidase (PPO) is still an important challenge in food processing as shown in the case of green roselle, where its utilization as raw materials of food products is hindered by its susceptibility to enzymatic browning. The aim of this work was to evaluate the effect of anti-browning treatments on physicochemical characteristics and sensory acceptance of green roselle pickle (*Hibiscus sabdariffa* L. var. UKMR-3). Two types of physical (hot water blanching and steam blanching) and three types of chemical treatments (0.15M citric acid, 0.15M ascorbic acid and 0.15M calcium chloride) were applied as anti-browning treatments. Different anti-browning treatments significantly affected ($p < 0.05$) the physicochemical characteristics (total soluble solids, yellowness, pH, titratable acidity, firmness and proximate compositions) and sensory properties (color, texture and overall acceptance) of green roselle pickle. Green roselle pickle treated with 0.15M calcium chloride is the suggested treatment since it had the highest firmness and high greenness. It also had the second highest score of overall acceptance and second highest vitamin C content after 10 days of pickling. These results showed that with proper anti-browning treatment, green roselle has potentials to be produced into food products such as pickle.

ABSTRAK

Perencanaan pemerangan berenzim yang dimungkinkan oleh polyphenol oxidase (PPO) masih merupakan satu cabaran yang penting dalam pemprosesan makanan seperti dalam kes roselle hijau, di mana penggunaannya sebagai bahan mentah produk makanan dihalang oleh kecenderungannya menjadi mangsa pemerangan berenzim. Tujuan kerja ini adalah untuk menilai kesan rawatan anti-pemerangan pada ciri-ciri fizikokimia dan penilaian deria jeruk roselle hijau (*Hibiscus sabdariffa L. var. UKMR-3*). Dua rawatan fizikal (celur stim dan celur air panas) dan tiga jenis rawatan kimia (0.15M asid sitrik, 0.15M asid askorbik dan 0.15M kalsium klorida) telah digunakan sebagai rawatan anti-pemerangan. Rawatan anti-pemerangan yang berbeza mempengaruhi ciri-ciri fizikokimia (jumlah pepejal terlarut, kekuningan, pH, asiditi titrat, tekstur dan komposisi proksimat) dan sifat sensori (warna, tekstur dan penerimaan keseluruhan) dengan ketara ($p < 0.05$). Jeruk roselle hijau dengan rawatan 0.15M kalsium klorida merupakan rawatan yang disyorkan kerana ia mempunyai tekstur yang terbaik dan kehijauan dengan baik. Ia juga mempunyai skor yang kedua tertinggi dalam penerimaan keseluruhan dan kandungan vitamin C yang kedua tinggi. Keputusan ini menunjukkan bahawa roselle hijau mempunyai potensi untuk dihasilkan sebagai produk makanan seperti jeruk jika dirawat dengan anti-pemerangan yang sesuai.