NORLIANA BT. ABD. RAZAK

FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU
2017

ANTIOXIDATIVE CONSTITUENTS OF *Souropus androgynus* (CEKUR MANIS) AND *Piper sarmentosum* (KADUK)

By
Norliana Bt. Abd. Razak

Research Report in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Biological Sciences)

Department of Biological Sciences
Faculty of Science and Technology
UNIVERSITI MALAYSIA TERENGGANU
2007

This project should be cited as:

Norliana, A. R. 2007. Antioxidative Constituents Of *Souropus androgynus* (Cekur Manis) and *Piper Sarmentosum* (Kaduk). Undergraduate thesis, Bachelor of Sciences (Biological Sciences), Faculty Of Science And Technology, Universiti Malaysia Terengganu. 53p.

UNIVERSITI MALAYSIA TERENGGANU

JABATAN SAINS BIOLOGI
FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU

PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II
RESEARCH REPORT VERIFICATION

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **ANTIOXIDATIVE CONSTITUENTS OF *Souropus androgynus* (CEKUR MANIS) AND *Piper sarmentosum* (KADUK).**Oleh **NOLIANA BINTI ABD. RAZAK**. no. matrik: **UK10216**. telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah **SARJANA MUDA SAINS (SAINS BIOLOGI)**, Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

Disahkan oleh: / Verified by:

.....

Penyelia Utama / *Main Supervisor*

Nama: PUAN NORHAYATI BINTI YUSUF.

Cop Rasmi: NORHAYATI BINTI YUSUF
Pensyarah
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu.

Tarikh: 7/5/07

.....

Penyelia Kedua (jika ada) / *Co-Supervisor (if applicable)*

Nama:

Cop Rasmi

Tarikh: .....

.....

Ketua Jabatan Sains Biologi /*Head, Department of Biological Sciences*

Nama:DR. AZIZ BIN AHMAD.

Cop Rasmi:

DR. AZIZ BIN AHMAD
Ketua
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Tarikh: 7/5/2007

AKNOWLEDGEMENT

Ahamdulillah praise to Allah for His blessing and giving me patience to accomplish the experiment and report writing. There are many experience I have gain throughout the project started till the last draft.

First of all, I would like to extend my grateful to Puan Norhayati Bt Yusuf my supervisor. Her wonderful guidance and encouragement for the project was amazing . I have learned so much from her and expand my horizon through that gain.

This appreciations extended to lab assistant, Puan Fatimah, Cik Ku Naiza and En. Mazrul for their superb assist making the project carried out smoothly. Nevertheless, their passion to help others was the greatest thing somebody can give.

Last but not least, for my family, mother and fathers, and my other siblings, thanks to you for support me. And for my friend Uday, Ainul,Ana, Rehan and others, thanks for lend me a hand along my study research.

TABLE OF CONTENTS

CURRICULAR VITAE

LIST OF ABBREVIATIONS

%	-	Percentage
µg	-	Microgram
µg/g	-	Microgram pergram
µg/ml	-	Microgram permililiter
µl	-	Microliter
$^1O_2$	-	Singlet oxygen
APx	-	Ascorbate Peroxidase
ASA	-	Ascorbate
CAT	-	Catalase
cm	-	Centrimeter
DNA	-	Deoxybonucleic acid
fwt	-	Fresh weight
g	-	gram
GR	-	Glutathione Reductase
H_2O_2	-	Hidrogen peroxide
mg	-	Miligram
mg/g	-	Miligram pergram
Mg/l	-	Miligram perliter
mg/ml	-	Miligram permililiter
ml	-	Mililiter
mM	-	Milimolar
nm	-	Nanometer
$O_2^{\cdot -}$	-	Superoxide radical
°C	-	Degree celcius
PDT	-	3-(2-Pyridyl)-5,6-dipeny-1,2,4 trianzine
POX	-	Peroxidase
ROS	-	Reactive Oxygen Species
rpm	-	Revolution per minutes
SOD	-	Superoxide Dismutase

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

Dietary antioxidants include enzymatic and non-enzymatic antioxidant as well as bioactive plant phenols. The health benefits of 'ulam' are largely due to the antioxidant vitamins supported by the large number of phytochemicals, some with greater antioxidant properties. So, the objective of this study were to determine and to compare the level of antioxidative constituents; carotenoid, ascorbic acid, α-tocopherol concentration as well as catalase (CAT), ascorbate peroxidase (APx) and guaiacol peroxidase (POD) specific activities in *S. androgynus* and *P. sarmentosum*. *P. sarmentosum* contained significantly higher concentration of carotenoid as well as POD specific activity while *S. androgynus* contained significantly higher CAT specific activity compared to *P. sarmentosum*. There were no significant differences in ascorbic acid and α-tocopherol concentration, as well as in APx specific activity in *P. sarmentosum* and *S. androgynus*. Results revealed that both 'ulam' are a good sources of a natural dietary antioxidant for human.

KANDUNGAN ANTIOKSIDAN *Souropus androgynus* (CEKUR MANIS) dan *Piper sarmentosum* (KADUK)

ABSTRAK

Antioksidan dalam diet termasuk enzim dan bukan enzim antioksidan dan juga bioaktif fenol tumbuhan. Ulam mempunyai faedah yang sangat besar kepada kesihatan disebabkan oleh kandungan vitamin antioksidan dan disokong oleh kandungan fitokimia yang banyak dan setengahnya mempunyai lebih banyak sifat antioksidan. Oleh itu objektif kajian ini adalah untuk menentukan dan membandingkan kandungan antioksidan; karotenoid, asid askorbik, α- tokoferol dan aktiviti spesifik enzim katalase (CAT) , askorbat peroksida (APx) and guaiacol peroksida (POD) dalam *S. androgynus* dan *P. sarmentosum*. *P. sarmentosum* mengandungi kepekatan karotenoid dan aktiviti spesifik enzim POD yang lebih tinggi manakala *S.androgynus* mengandungi aktiviti spesifik enzim CAT yang lebih tinggi berbanding dengan *P. sarmentosum*. Tiada perbezaan signifikan dalam kepekatan asid askorbik dan α-tokoferol juga aktiviti spesifik enzim APx di dalam daun *P. sarmentosum* dan *S. androgynus*. Keputusan menunjukkan bahawa semua ulam adalah merupakan sumber antioksidan semulajadi yang baik dalam diet manusia.