

**ANALYSIS OF ANTIOXIDANT CONTENT IN YELLOW AND RED
ONION (*ALLIUM CEPA* L.)**

MOHD FIRDAUS BIN MOHAMAD

**Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Chemistry
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

JANUARY 2019

ABSTRACT

ANALYSIS ANTIOXIDANT CONTENT IN RED AND YELLOW ONION

(*ALLIUM CEPA L.*)

Onion is a common type of vegetable used in our daily food intake. It is rich in antioxidant that can protect human body from free radical reactive oxygen. Through this research, the analysis antioxidant content of red and yellow onion using different extraction solvent was measured which are methanol, chloroform and hexane. The best extraction solvent is methanol compared to chloroform and hexane. Preliminary test was conducted to analyze type of antioxidant and metabolic compound contained in onion. Red onion showed high presence of phenolic antioxidant types from phenol group. Through this analysis, it showed that red onion contained highest antioxidant content 177.59 $\mu\text{M Fe[II]}/\text{mL}$ onion extract and the lowest is red 47.02 $\mu\text{M Fe[II]}/\text{mL}$ onion extract with hexane extraction by FRAP method where Fe^{3+} -TPTZ complex is reduced by antioxidants to intense blue forming Fe^{2+} - TPTZ absorbance 593 nm.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF ABBREVIATIONS	vi
LIST OF SYMBOLS	vii
ABSTRACT	viii
ABSTRAK	ix
CHAPTER 1 INTRODUCTION	
1.1 Background of study	1
1.2 Problem statement	3
1.3 Significance of study	4
1.4 Objectives of study	5
CHAPTER 2 LITERATURE REVIEW	
2.1 Antioxidant activity	6
2.2 Antioxidant in vegetables	
2.2.1 Antioxidant in various type of vegetable	7
2.2.2 Antioxidant activity with different extraction solvent for vegetables	9
2.2.3 Antioxidant activity in onion	10
2.3 Method to determine the antioxidant activity	11
CHAPTER 3 METHODOLOGY	
3.1 Sample	12
3.2 Chemicals	12
3.3 Instrumentation	13
3.4 Sample preparation	13
3.5 Phytochemical screening	
3.5.1 Test of flavonoids	
3.5.2 Test of alkaloids	14
3.5.3 Test of saponins	14
3.5.4 Test of phenolics	15
3.5.5 Test of terpenoids	15
3.5.6 Test of tannins	15
3.6 Ferric Reducing Antioxidant Power (FRAP) Assay Method	15
	15
CHAPTER 4 RESULTS AND DISCUSSION	

4.1	Phytochemical screening	16
4.2	Antioxidant activity	19
	4.2.2 Comparison of antioxidant activity in red and yellow onion	19

**CHAPTER 5 CONCLUSION AND
RECOMMENDATIONS**

27

REFERENCES

29

**APPENDICES
CURRICULUM VITAE**

36

41

LIST OF TABLES

Table	Caption	Page
2.1	Antioxidant activity in different type of plant	8
4.1	Phytochemical screening of yellow and red onion with different extraction solvent.	17
4.2	Antioxidant activities by FRAP assay in red onion and yellow onion	21