STUDY OF EXTRACTION AND STABILITY CONDITION FOR ANTIOXIDANT PROPERTIES FROM KELAKAI (*Stenochlaena palustris*) EXTRACT

By

Nadia Amanda Rifky
11305018

BACHELOR'S DEGREE
in

FOOD TECHNOLOGY
FACULTY OF LIFE SCIENCE AND TECHNOLOGY

SWISS GERMAN UNIVERSITY
The Prominence Tower
Jalan Jalur Sutera Barat No. 15, Alam Sutera
Tangerang, Banten 15143 - Indonesia

August 2017

Revision after the Thesis Defense on 20th July 2017

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

Nadia Amanda Rifky

Student Date

Approved by:

Della Rahmawati S.Si, M.Si

Thesis Advisor Date

Ir. Abdullah Muzi Marpaung, M.P

Thesis Co-Advisor Date

Dr. Dipl.-Ing. Samuel P. Kusumocahyo

Dean Date

ABSTRACT

STUDY OF SUITABLE CONDITIONS IN THE EXTRACTION AND STABILITY TEST FOR ANTIOXIDANT ACTIVITY FROM KELAKAI (*Stenochlaena palustris*) PLANT

By

Nadia Amanda Rifky
Della Rahmawati S.Si, M.Si
Ir. Abdullah Muzi Marpaung, M.P

SWISS GERMAN UNIVERSITY

The aims of this research are to discover the suitable conditions in the extraction and stability test for antioxidant activity from kelakai (*Stenochlaena palustris*) plant. The extraction process was done through two different solvents (ethanol & distilled water) and three extraction times (12, 24, 48 hours). It was found that samples which were extracted in distilled water for 48 hours had higher antioxidant activity, higher phenolic and flavonoids content. Next, the selected optimum extract was tested for its stability in different pH (4, 5, 6, 7), temperatures (5^{o}C, 30^{o}C, 50^{o}C, 70^{o}C, 90^{o}C), and light conditions (bright and dark). From stability test with the effect of different pH, it was revealed that samples with addition of pH 4 and 5 had higher antioxidant activity. Likewise, samples with pH 5 were found to have higher phenolic and flavonoids content. As the effect of different temperatures, it was discovered that temperature of 70^{o}C was suitable for antioxidant activity and flavonoids content of *Stenochlaena palustris* extract and 50^{o}C was suitable for the phenolic content. All of the data within this research were obtained through analysis methods of DPPH scavenging activity, total phenolic content, and total flavonoids content assay. Some active components in optimum *Stenochlaena palustris* extract were also found through LC/MS analysis.

Keywords: antioxidant activity, phenolic, flavonoids, stability, extraction, pH, temperatures

DEDICATION

I dedicate this thesis to everyone who plays a role not only in my academic accomplishment but also in my life.

ACKNOWLEDGEMENTS

First and foremost, full thanks to Allah SWT for allowing me to finish this research by giving the blessing and strength through all the times and conditions. I also wish to express my sincere gratitude to all people who were abundantly helpful and offered invaluable assistance, support, and guidance. Without them, this bachelor thesis would not have been completed. Hence, deepest appreciation is respectfully given to these contributing people,

Above all, I would like to thank my family for their personal support, unending prays, and great patience at all times.

I would also like to thank Ms. Della Rahmawati S.Si, M.Si as my advisor for her sincere guidance and help for getting this research done. As well, I would like to thank Mr. Ir. Abdullah Muzi Marpaung, M.P as my co-advisor for his kind hearted in guiding, supporting, and helping me to finish this thesis.

Not to forget, I would like to express a massive gratitude to all laboratory assistants; Kak Noni, Kak Roziq, Kak Gerlad, Kak Rara. Thanks to them for always spending more time in laboratory and helping us.

A heartiest gratitude likewise goes to all my beloved friends; Brenna, Chita, Felicia, Grace, Lavina, Regina, Ruth, Tiwi, Annelies who always be around through ups and downs and whenever I need them. I also send my particular thanks to Nadya for always cheering me up by being a dumber. Moreover, thanks to Kak Citra, Cahyo, Justin, Elias, Ajeng, Dimas, Kak Mutia and other used-to-be lab members for all the laughter, jokes, understanding, and helps. Lastly, big thanks to all my friends in faculty of life science and technology batch 2013. Thanks for all the unforgettable moments throughout these 4 years together.

Jakarta, 19th June 2017

Nadia Amanda Rifky

TABLE OF CONTENTS

Page