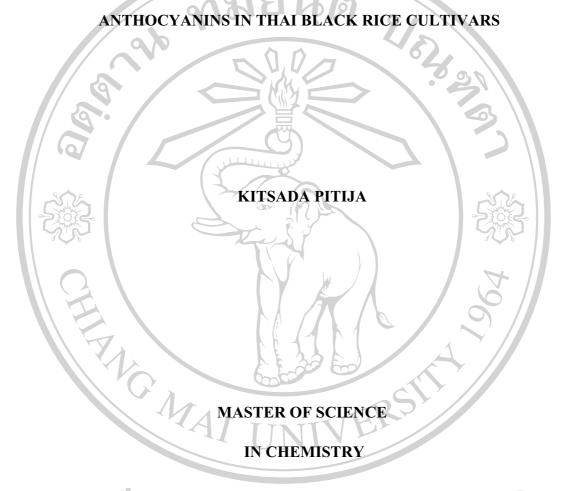
APPLICATION OF LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY

AND TANDEM MASS SPECTROMETRY TO THE IDENTIFICATION OF



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All rights reserved

THE GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

FEBRUARY 2009

APPLICATION OF LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY AND TANDEM MASS SPECTROMETRY TO THE IDENTIFICATION OF ANTHOCYANINS IN THAI BLACK RICE CULTIVARS

KITSADA PITIJA

A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN PARTAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTER OF SCIENCE

adansum of the Mai University

All rights reserved

THE GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

FEBRUARY 2009

APPLICATION OF LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY AND TANDEM MASS SPECTROMETRY TO THE IDENTIFICATION OF ANTHOCYANINS IN THAI BLACK RICE CULTIVARS

KITSADA PITIJA

THIS THESIS HAS BEEN APPROVED

TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF SCIENCE

IN CHEMISTRY

EXAMINING (COMMITTEE
	CHAIRPERSON
Ι	Dr. Apiwat Baramee
ລິບສິກຣິ້ນ	J-2MEMBER
A	Assoc. Prof. Dr. Sugunya Wongpornchai
Copyright ©	by Miang Mai University MEMBER
D	r. Prasat Kittakoop

13 February 2009 © Copyright by Chiang Mai University

ACKNOWLEDMENTS

The author would like to express his heartfelt gratitude and appreciation to his supervisor, Assoc. Prof. Dr. Sugunya Wongpornchai, for his kind supervision and valuable guidance throughout this research work.

The author would like to express his sincere thanks to Dr. Apiwat Baramee and Dr. Prasat Kittakoop for their thoughtful advice and suggestion.

The author gratefully acknowledges the technique service rendered by Mr. Pisan Kitsawatpaiboon and Mrs. Saifon Uttip and useful suggestion.

The author also would like to take this opportunity to thank the Department of Chemistry, Faculty of Science, Chiang Mai University, for kindly providing him with laboratory and library facilities which have made this study possible.

I gratefully thank the Center of Excellence for Innovation in Chemistry (PERCH-CIC) and the Graduate School Chiang Mai University for financial supports.

The author is profoundly grateful to his family for their tender love, continual care and encouragement during his study in the M.Sc. program. Finally, the author thank to all of his friends in Rice Chemistry Research Group, the Department of Chemistry, Faculty of Science, Chiang Mai University.

ghts re