PHYSICOCHEMICAL PROPERTIES ACROSS SPECIES BREADTH AND QUALITY CHANGES OF STINGLESS BEE (APIDAE: MELIPONINI) HONEY DURING STORAGE

BAJAREE CHUTTONG

DOCTOR OF PHILOSOPHY
IN POSTHARVEST TECHNOLOGY

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

GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
JUNE 2015

PHYSICOCHEMICAL PROPERTIES ACROSS SPECIES BREADTH AND QUALITY CHANGES OF STINGLESS BEE (APIDAE: MELIPONINI) HONEY DURING STORAGE

BAJAREE CHUTTONG

A THESIS SUBMITTED TO CHIANG MAI UNIVERSITY IN PARTIAL FUFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN POSTHARVEST TECHNOLOGY

Copyright[©] by Chiang Mai University

All rights reserved

GRADUATE SCHOOL, CHIANG MAI UNIVERSITY
JUNE 2015

PHYSICOCHEMICAL PROPERTIES ACROSS SPECIES BREADTH AND QUALITY CHANGES OF STINGLESS BEE (APIDAE: MELIPONINI) HONEY DURING STORAGE

BAJAREE CHUTTONG

THIS THESIS HAS BEEN APPROVED TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN POSTHARVEST TECHNOLOGY

Examination Committee:	Advisory Committee:
M. Titaya. Chairman	Advisor
(Assoc. Prof. Dr. Manas Titayavan)	(Dr. Yaowaluk Chanbang)
Member Member	
(Dr. Yaowaluk Chanbang)	(Dr. Korawan Sringarm)
Member Nember	W. OB-qell Co-advisor
(Dr. Korawan Sringarm)	(Prof. Dr. Michael Burgett)
W.D. Brogst Member	
(Prof. Dr. Michael Burgett)	
(Dr. Chaochad Santagun)	

29 June 2015 Copyright © by Chiang Mai University

To
Stingless Bee



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

ACKNOWLEDGEMENT

Words are often inadequate to express my sincere gratitude and appreciation to Dr. Yaowaluk Chanbang, my major advisor for her interest guidance and encouragement during my graduate studies.

I would like to thank Dr. Korawan Sringarm for the incomparable support you gave in my laboratory studies. Working with you has been a most rewarding moment because you always give me constructive solution for every question without minding my fault.

I sincerely acknowledge the help provided by Professor Dr. Michael Burgett who is the source of my strength and sustenance. Thank you so much for your suggestions, devotion and unique support during my trying moments.

Though many people say that I am good luck to be your advisee, I would hereby acknowledge that it is because you all are so great and perfect. Success is the fruit of personal effort plus support and encouragement from you all.

I profoundly thank Dr. Hans Banziger for his precise stingless bee identification.

My sincerely thank to Associate Professor Dr. Manas Titayavan and Dr. Choochad

Suntasup for their helpful advice and comments.

I would like to express my gratitude for the support from Science and Technology Research Institute, Chiang Mai University. Thank you for giving me both time and fund through my study.

I finally wish to thank my parents for teaching me what it meant to be, who I am and hold my head up high.

Bajaree Chuttong