

**STUDY OF LACCASE FROM BASIDIOMYCETE FUNGI FOR
APPLICATION IN PAPER PULP BIOBLEACHING**

NITTAYA WANPHRUT

**A THESIS SUMMITTED TO THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE
IN BIOTECHNOLOGY**

**GRADUATE SCHOOL
CHIANGMAI UNIVERSITY
SEPTEMBER 2001**

**STUDY OF LACCASE FROM BASIDIOMYCETE FUNGI FOR
APPLICATION IN PAPER PULP BIOBLEACHING**

NITTAYA WANPHRUT

**THIS THESIS HAS BEEN APPROVED
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE
IN BIOTECHNOLOGY**

EXAMINING COMMITTEE

C. Khanongnuch

.....CHAIRMAN

Lecturer Dr. Chartchai Khanongnuch

Saisamorn Lumyong

.....MEMBER

Associate Professor Dr. Saisamorn Lumyong

Worawan Chaleeprom

.....MEMBER

Lecturer Dr. Worawan Chaleeprom

Narumol Thongwai

.....MEMBER

Lecturer Dr. Narumol Thongwai

12 September 2001

Copyright by the Graduate School, Chiang Mai University

ACKNOWLEDGEMENT

I would like to express my profound appreciation and gratitude to my adviser, Dr. Chartchai Khanongnuch, for his kindness to give me an opportunity for the Master's degree education, invaluable advises, generous support, constant encouragement, guidance of this research work, and help on the manuscript. I would like to thank Assoc. Prof. Saisamorn Lumyong, a co-adviser from Biology Department, Faculty of Science, Chiang Mai University for her kindness in corporation both chemicals and equipment. I also thank Assoc. Prof. Takashi Watanabe from Wood Research Institute, Kyoto University, Japan, who helped me a great deal on many useful suggestion, generous support, and corporation.

I would like to extend the appreciation and gratitude to all examining committee members, Dr. Worawan Chaleeprom and Dr. Narumol Thongwai, for their guidance and valuable suggestion.

Special thanks to Graduate School Foundation of Chiang Mai University for awarding me, for the thesis of Technological Science, and the government scholarship. I also thanks the Phoenix Pulp and Paper Company for supporting eucalyptus pulps used in the bleaching experiment.

I would like to thank the Biotechnology Department for providing the equipment used and facilities. I am thankful all teachers who gave me knowledge and generous suggestion. I also thank all of my friends in the department, especially the first generation Master student, for their friendship, sincere assistance and warm relationship during my graduate study.

Finally, I would like to give the special thanks to Mr. Bunloet Kulprangthong for his generous support, warm encouragement, and the assistance in computer works.

I am thankful with all gratitude to my parents, elder brother, and sister for their warm love and encouragement to overcome every difficulty and hardship throughout my study.

Nittaya Wanphrut