

**BIOCONVERSION OF BIODIESEL-DERIVED CRUDE
GLYCEROL TO LIPIDS AND CAROTENOIDS BY
OLEAGINOUS YEASTS**

ATCHARA MANOWATTANA

**DOCTOR OF PHILOSOPHY
IN BIOTECHNOLOGY**

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**GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
JULY 2016**

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ATCHARA MANOWATTANA

**A THESIS SUBMITTED TO CHIANG MAI UNIVERSITY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN BIOTECHNOLOGY**

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GRADUATE SCHOOL, CHIANG MAI UNIVERSITY

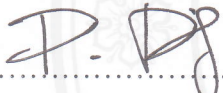
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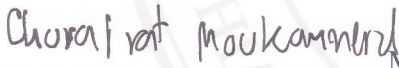
ATCHARA MANOWATTANA

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


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15 July 2016

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ACKNOWLEDGMENT

I would like to express my special thanks of gratitude to my advisor Asst. Prof. Dr. Thanongsak Chaiyaso, Division of Biotechnology, Faculty of Agro-Industry, Chiang Mai University for his kindness, invaluable advices, generous support, constantly encouraged me throughout all of this research work and also educated me to possess the scientific mind of thinking and problem solving. This research can be accomplished with his kindness, understanding and assistance.

Similarly, I am also grateful to thesis committee: Dr. Punyawatt Pintathong School of Cosmetic Science, Mae Fah Luang University, for his helpful suggestions and to an external chairperson, Dr. Churairat Moukamnerd, Division of Biotechnology, Faculty of Agro-Industry, Chiang Mai University, for her helpful suggestions and to an external member, Asst. Prof. Dr. Phisit Seesuriyachan, Asst. Prof. Dr. Prasert Hanmoungjai, Division of Biotechnology, Faculty of Agro-Industry, Chiang Mai University and Dr. Ratchapol Pawongrat, Department of Science, Faculty of Liberal Arts and Science, Kasetsart University for recommendations and suggestions on this research work. Moreover, I would like to express my gratitude to all staffs in the Division of Biotechnology, Faculty of Agro-Industry, Chiang Mai University, for their teaching and guidance.

This work has been financial supported by the Faculty of Agro-Industry and the Graduate School, Chiang Mai University, Energy Policy and Planning Office (EPPO), Ministry of Energy and The Thai National Research University (NRU) Project under the Office of the Higher Education Commission, The National Research Council of Thailand (NRCT), Thailand. Moreover, I would like to thank the Energy Research and Development Institute (ERDI), Chiang Mai University, for a kindly gift of the crude glycerol. I also would like to thank the Thailand Institute Scientific and Technological Research (TISTR), Thailand, for all strains of oleaginous red yeasts.

Finally, I am deeply indebted to my family especially, my parents for their love and encouragement to overcome every difficulty and understanding during the entire period of this study. I would like to thank my friends for their encouragement and friendships.

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