UNIVERSITI TEKNOLOGI MARA

INHIBITION OF PANCREATIC LIPASE BY MELASTOMA MALABATHRICUM FRUIT EXTRACT IN VITRO

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Thesis submitted in fulfilment
of the requirements for the degree of
Bachelor of Engineering (Hons) Chemical

Faculty of Chemical Engineering

July 2019

ABSTRACT

Obesity has become global health problems since it is generally associated with many diseases. Currently, anti-obesity treatment used synthetic drugs to overcome obesity but this synthetic drugs has been proven to have adverse side effects to human. Thus, this research was done in order to discover new anti-obesity drug based on natural product. *Melastoma malabathricum fruit* (*MMF*) or locally known as 'buah senduduk' possess high total antioxidant and high total phenolic content which has potential as PL inhibitor that could treat the obesity. Aims of this research was to determine the content of Gallic Acid (GA) and Quercetin (Q) that present in MMF. This research also was done in order to identify the inhibitory activity of *MMF* extract against pancreatic lipase (PL) in vitro. The study was carried out by using water based extraction method and were prepared by using heat and without heat. From *Fourier Transform Infrared (FTIR) Spectroscopy Analysis*, it was founded that the MMF consist of alcohol, alkynes and alkenes functional group. From phytochemical screening, the highest TPC value obtained were 1.133 mg GAE/g extract and 2.031 mg GAE/g extract for extraction without heat and extraction with heat respectively. As for TFC, the highest TFC value obtained were 0.818 mg QE/g extract and 0.835 mg QE/g extract for extraction without heat and extraction with heat respectively. The samples prepared with heat; MMF (99.52%) exhibits higher percentage inhibition then Q (98.15%). Thus, it suggested that the natural inhibitor is better than snythetic inhibitor. This result suggests that MMF has a potential role in therapy for obesity-related disorders.

ACKNOWLEDGEMENT

Thanks to Allah the Al-Mighty for His blessing during the completion of my Bachelor Degree Research Project. I would like to express my gratitude to the Universiti Teknologi Mara, especially Faculty of Chemical Engineering, for giving me the opportunities and support to pursue a degree in chemical engineering.

The work presented within this thesis would not have been possible without the contribution of many people. First, I would like to graciously acknowledge my supervisor, Dr.Sherif AbdulBari Ali for his guidance through my research project. Dr.Sherif is a great mentor with a lot of patience, enthusiasm and easy approachability. The knowledge and skills I gained both directly and indirectly from Dr.Sherif have been far and beyond my expectations and will be invaluable in my professional development.

I also would like to express my appreciatiation toward my co-supervisor, Miradatul Najwa Bt Mohd Rodhi. Her wealth of knowledge and experience in biotechnology and her desire to explore and discover new novelty in anti-obesity treatment really give a great inspiration to me.

Furthermore, I also would like to thank my labmates who are a really great help to me during clinical test in completing this research. Lastly, I must acknowledge the tremendous support from my family and friends during this long and challenging process, especially my parents who are helping me to collect the raw material for this research.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The global obesity epidemic has lead to the global health crisis. Obesity is defined as a condition or a state of excess adipose tissue mass due to the imbalance energy intake and energy expenditure, or a combination of the two. According to the previous studies, health complications such as type 2 diabetes, cardiovascular diseases and certain cancers are linked to the overweight and obesity. According to the recent report in the *New Straights Time 2018,* Malaysia is suspected as highest obesity prevalence in Southeast Asia. Currently, obesity and overweight statistic in Malaysia are 13.3% and 38.5% respectively. This mean 51.8% in total of Malaysia's population either obese or overweight. Thus, the obesity epidemic has skyrocket compared to 43% of Malaysian either obese or overweight based on *World Health Organization(WHO)* survey in 2010.

Currently, there are two ways of treatments in dealing obesity which are modulation of mechanisms for energy homeostasis either through peripherally acting or centrally acting. Centrally acting is regulation of food intake while peripherally acting is by affecting absorption of dietary fat, affecting storage and metabolism of fat or increasing heat generation from dietary fat *(Lunagariya,Patel and et al.,2014).*

The focus of this study is on peripherally acting by using an agent that interfer with the hydrolysis and absorption of dietary lipids which is called as inhibitor. In digestive system, digestion and absorption of nutrient such as lipids, proteins, and carbohydrates are done by pancreatic enzymes. These enzymes presence in the pancreatic juice that secreted by pancreas. Pancreas is a triangular gland and play a cetral role as digestive organ due to its role as to delivere pancreatic enzymes to the small intestine for the hydrolysis of complex nutrients*(C.Whitcomb and E. Lowe,2006).*