EFFECT OF SUBSTRATE CONCENTRATION AND REACTION TIME OF *AQUILARIA MALACCENSIS* LEAVE EXTRACT ON INHIBITION OF PANCREATIC LIPASE

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ABSTRACT

EFFECT OF SUBSTRATE CONCENTRATION AND REACTION TIME OF *AQUILARIA MALACCENSIS* LEAVE EXTRACT ON INHIBITION OF PANCREATIC LIPASE

Obesity has been arising from a day to day and has become a very complicated health issue worldwide that must be seriously taken. From the research, this complicated problem can be solved by inhibiting pancreatic lipase that will block the absorption of fat. Thus, the main focus of this research were identification of the presence of phenolic and flavonoid compound that can be derived from Aquilaria malaccensis leaves extract to inhibit the pancreatic lipase and determination of the effect of substrate concentration and reaction time of A. Malaccensis leaves extract on inhibition of pancreatic lipase. There were only Gallic acid and Quercetin compunds used in this study to determine the total phenolic and flavonoid contents respectively. This study was conducted in two different types of A. Malaccensis leaves which were dried and fresh leaves. Both types of leaves were pretreated by ultrasonication and then distilled through hydrodistillation by using a TOPS MS-6 heating mantle followed by evaporation using a Heidolph rotary evaporator. Finally, the presence of phenolic and flavonoid compound in A. Malaccensis leaves extract was analysed by using Total Phenolic Content (TPC) assay and Total Flavonoid Content (TFC) Assay respectively and also using High Performance Liquid Chromatography (HPLC). The parameters involved in the process were substrate concentration (100µM, 200µM, 300µM) and reaction time (20, 40, 60 minutes) during inhibition of pancreatic lipase process. From the result obtained, the value of TPC and TFC was higher in fresh leaves extract compared to dry leaves extract as the absorbance increase. Besides, the concentration of phenolic and flavonoid in fresh leaves extract by using HPLC was higher compared to dry leaves as the area of the peak in the graph was larger. Lasty, the percentage of inhibition was higher by utilizing lower substrate concentration from both dry and fresh samples as the value of absorbance increased.

CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Today, agarwood has so many significant itself in this globalization particular period, particularly in Chinese herbal medicine, where almost the plant materials are applied. It is also utilized in many cultures for religious ceremonies and perfumes (Kuo et al., 2015). Because of the high demands of this plant material, the number of agarwood producing tree species declines and have become endangered since the agarwood has been harvested from forests for hundreds of years. Therefore, agarwood should be produced in a sustainable way by mass the trees and collecting agarwood in proper manner without destroy it, planting in society to conserve this valuable tree species. Furthermore, the formation of agarwood in trees by applying the artificial methods with the aid of microorganisms can be done (Mohamed, Jong, & Zali, 2010).

Aquilaria species are an aromatic plant that is found in 10 countries which are Malaysia, Indonesia, India, Iran, Singapore, Bhutan, Bangladesh, Myanmar, Philippine, and Thailand (Oldfield, 1998). In Malaysia, *Aquilaria malaccensis* is the biggest yielder of agarwood rich in phytochemical contents in its resin (Jamahseri, Najwa, Rodhi, Zulkarnain, & Husain, 2014). The resin produced by *Aquilaria* species generally called as a gaharu and it is produced by a main genus which is *A. malaccensis* in Malaysia and Indonesia. It is one of 15 tree species in the Indomalesian genus *Aquilaria*, mainly of family Thymelaeaceae, (Mabberley, 1997) and class Magnoliopsida. Besides that, there are many names given for this tree including agarwood, eaglewood, aloeswood, gaharu, kanankoh, kyara ,oud, oudh, jinkoh, tomention, chen xiang, and kalamabak (Khalil, A.S. , Rahim, A.A. , Taha, K.K., Abdallah, 2013).