UNIVERSITI TEKNOLOGI MARA

RELATIVE EXPRESSION OF ALPP GENE IN LUNG CANCER INDUCED BY GELAM HONEY BY QUANTITATIVE REVERSE TRANSCRIPTION POLYMERASE CHAIN REACTION

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Dissertation submitted in partial fulfillment of the requirement for the Degree in Bachelor of Pharmacy

Faculty of Pharmacy

2014

TABLE OF CONTENTS

ACKNOWLEDGEMENT

First and foremost, I would like to praise to Allah because with His blessing this thesis was completed successfully. Here, I would also express a very special thanks to my supervisor Dr. Rosmadi bin Mohd Yusoff for his full and continuous supervision and support of my research, for his patience, motivation and meaningful knowledge. Without him this research will not been done successfully.

Beside of my supervisor, I would like to give special thanks to all the members of Brain Lab, Faculty of Pharmacy UiTM Puncak Alam for helping me a lot during conducting the research and also for the write up of this thesis.

Last but not least, a very warm and sincere thanks to my parents, family member and friends who were always with me and supporting me spiritually throughout this life.

ABSTRACT

Honeys have been proven to have an anti-oxidant and antitumor properties and Gelam honey was confirmed to have an ability of suppressing colon cancer cell growth. However, there are not many scientific studies that have been conducted to investigate the antitumor effects of Malaysian Gelam honey on lung cancer cells. ALPP gene code for alkaline phosphatase, which function in the regulation of phosphorylation, where phosphorylation play important and significant role in regulating the function of tumor suppressor protein, p53.The study is an initial attempt to investigate the relative expression of ALPP gene in lung cancer cell upon treatment with Gelam honey by using real time reverse transcription polymerase chain reaction. For the gene expression, the total RNA which is extracted from the untreated and treated lung cancer cell was reverse transcripted into cDNA and amplified with qRTPCR. The relative quantification of gene expression is calculated using Delta-delta Ct method. The result of this study revealed that the expression ALPP gene in treated lung cancer cell with Gelam honey is up-regulated. From the normalization of gene expression using $2^{-\Delta\Delta Ct}$ method, the ALPP gene is increased by 14.42 folds in the lung cancer cell which was treated with Gelam honey. Hence it can be concluded that ALPP gene showed different expression when treated with Gelam honey, where it is up-regulated. This up-regulation of ALPP gene showed that Gelam honey possessed therapeutic effect on lung cancer as up-regulation of ALPP gene will inhibit the growth of lung cancer cell by activated the p53 tumor suppressor protein.

CHAPTER 1: INTRODUCTION

1.1 Background of study

Honey is a sweet natural product that is made by honey bee using flower's nectar. It is a well-known natural food and has been used since ancient time to treat many types of disease or health condition. Its benefits for human health are stated in the holy Quran, Torah and Bible. (Teh et al., 2012).

There are many types of honey that can be found all over the world and their medicinal benefit have been proven by scientific evidence. Several health beneficial effect of honey includes accelerating or initiating wound healing process by stimulating the inflammatory cytokine production from monocytes (Tonks et al., 2003), acts as anti-proliferative and anti-tumor cytotoxicity in human prostate adenocarcinoma (Samarghandian, Afshari, & Davoodi, 2010), inhibit human breast cancer growth via its apoptotic effect and modulation NF-kB, the cell cycle and angiogenesis (Wu et al., 2011).

Several types of Malaysian honey include Tualang, Gelam, Coconut and Nenas Honey. Among these, the most well-known honeys for their health benefits are Tualang and Gelam honey. Their therapeutical benefits includes antioxidant and anti-inflammatory activities(Teh et al., 2012). It has also been shown that Tualang honey contain phenolic