

UNIVERSITI TEKNOLOGI MARA

**ANTICANCER EFFECTS OF GINGER EXTRACTS
FROM RHIZOMES OF *ZINGIBER OFFICINALE*
AGAINST HUMAN LIVER CANCER CELLS**

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ABSTRACT

The rhizome of ginger (*Zingiber officinale*), is the most widely used as a condiment for various food and beverages. Hepatocellular carcinoma is the most common liver cancer in adults. In this study two types of cell lines, WRL68 (non-tumourigenic fetal liver) cells and HepG2 (human hepatocarcinoma) cells were used. Ginger extracts has been claimed to be a potent antioxidant, thus the aim of this study was to investigate the possible synergistic, additive or antagonist cytotoxicity effects of ginger (*zingiber officinale*) in these cells. Cells were plated in 96-wells plates and incubated in conditions of 95% O₂, 5% CO₂, at 37°C. MTS assay was used to measure the cell viability. Concentration response curve for ginger extract were constructed to determine the effects of concentration on cell viability and to calculate the median inhibitory concentrations (IC₅₀) for each of the compound. The results showed that both ginger extracts (EA) and (MeOH) at higher concentration (1000 µM) were more effective cytotoxic effect in HepG2 cells.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Liver cancer is the fifth most common cancer in the world and it is also the third leading cause of cancer-related deaths worldwide. In 1990, the estimation of World Health Organization (WHO) were about 430,000 new cases of liver cancer worldwide, and a similar number of patients died as a result of this disease. About three quarters of the cases of liver cancer are found in Southeast Asia (China, Hong Kong, Taiwan, Korea, and Japan). Liver cancer is also very common in sub-Saharan Africa (Mozambique and South Africa) and Southeast Asia in which the frequency of liver cancer is greater than 20 cases per 100,000 populations. Moreover, recent data show that the frequency of liver cancer in the U.S. overall is rising (Tse-Ling F., 2009). In 2000, approximately 1223 cases were diagnosed in Malaysia. In Malaysia, liver cancer is the 10th most common cancer among men and the 15th most common cancer among women (Info Centre of Liver Health Promotion, 2008).

An approach to enhance the efficacy in reducing toxicity to normal tissues, novel therapeutics in phytochemicals would be potential agents for the treatment of human