UNIVERSITI TEKNOLOGI MARA

CYTOTOXICITY EFFECT ON LIVER CANCER CELLS AND XANTHINE OXIDASE INHIBITORY ACTIVITY OF FRUIT PEELS EXTRACT

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ABSTRACT

In this study the fruit peels extract consist of mango, honeydew and papaya was investigated to explore their cytotoxicity against liver cancer cell and xanthine oxidase inhibition activity in vitro. The total phenolic and total flavonoid content of the extract were also measured. For determination of cytotoxic property of extract against cells, both human hepatoma cell line HepG2 and human hepatic cell line Wrl66 cell lines were treated with extract and gallic acid as positive control which then incubated for 24 hours. MTT assay is used to determine the number of viable cells. The percentages of number of viable cells were measured by dividing absorbance sample with absorbance of control and multiply with 100%. The results showed that, extract give less cytotoxicity toward HepG2 cell as compared with gallic acid but higher cytotoxicity activity when compared with Wrl68 cell. In xanthine oxidase inhibition assay, allopurinol, gallic acid and quercetin were used to compare with extract. The results showed that, extract has quite the same value of inhibitory activity with allopurinol and quercetin toward xanthine oxidase but gallic acid has slightly lower inhibitory activity as compared with other. As a conclusion, fruit peels extract may have the potential to exhibit cytotoxic activity and able to inhibit xanthine oxidase. Their activity could be contributed by the total phenolic and flavonoids.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Cytotoxicity can be defined as a degree to which a substance has particular pernicious action on certain cells (Department of Health and Families, 2009). Cells which are being treated with cytotoxic agent can lead to several of cell fates whether the cells can undergo necrosis, the cells may stop growing and dividing or the cells can undergo apoptosis which is a genetic program that control cell death (Shweta P. Ghode, 2012). Cytotoxic therapy such as chemotherapy and radiotherapy are used to kill cancer cells, stopped from being growing and spreading to the other cells but it also may affect the normal cells (Department of Health and Families, 2009). The screening of cytotoxicity effect toward cells commonly uses an assay which is known as cytotoxicity assay that measure the viability of cells and cytotoxic effects based on the integrity of cell membrane (Sanjay Patels, 2009).

Cancer occurs due to abnormal cells are dividing without control, capable to invade other tissues and have the ability to spread to distant organs through blood and lymph systems (News Medical, 2014). A tumour which is a mass of abnormal cells will be formed when these cancer cells are proliferating. There are two types of tumours which are benign tumours and malignant tumours. Benign tumours are not cancerous as they did not spread to other parts of body and invade other organs while