

UNIVERSITI TEKNOLOGI MARA

**CYTOTOXIC ACTIVITY OF ENDOPHYTIC
FUNGAL EXTRACTS HAB2R1, HAB13R21, AND
HAB15L10 AGAINST BREAST AND COLON
CANCER CELL LINES**

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ABSTRACT

Cancer cells are abnormal cells that rapidly and excessively grow beyond their normal cell growth. From the total deaths worldwide, 13 percent were caused by cancer in 2005. The main types of cancers that lead to total death worldwide are; lung, stomach, liver, colon, and breast cancer. Breast cancer is the most common form of cancer affecting women in Malaysia while colon cancer is one of the most common malignancies in the world. Cancers can be treated by surgery, radiotherapy and chemotherapy. Approximately 50% of cancer patients receive chemotherapy. Currently, these anti-cancer drugs have some limitations; low selectivity and specificity, producing toxic effects and development of multi-drug resistance in patients. To date, anticancer drugs from natural sources are widely studied because these drugs may be potent towards cancer cells and less toxic which may exhibit better therapeutic outcome as compared to existing anticancer drugs. Endophytes are microorganisms that live symbiotically in healthy tissues of living plants. The first and most significant anticancer agent discovered was paclitaxel. It is widely used in the treatment against breast cancer. Due to high demand of new natural anti-cancer agent, this research is developed to investigate the cytotoxic properties of local endophytic fungi. The crude extracts of endophytic fungal that have been used in this research include the extract of HAB2 R1, HAB13 R21, and HAB15 L10. Interestingly, HAB15 L10 appeared to be effective towards colon and breast cancer cells. The average IC_{50} value of HAB 15 L10 was $0.35\mu\text{g/ml}$. This extract should be further studied due to its beneficial effects towards colon and breast cancer cells.

CHAPTER 1

INTRODUCTION

Cancer cells are abnormal cells that rapidly and excessively grow beyond their normal cell growth. The cancer cells then invade adjacent tissues and spread to other parts of the body (WHO, 2007). If cancer is not treated at its early stage, the metastasized cancerous cells may lead to death. From the total deaths worldwide, 13 percent were caused by cancer in 2005 (WHO, 2007). According to the World Health Organization facts, the main types of cancers that lead to total death worldwide are; lung, stomach, liver, colon, and breast cancer. Lung cancer accounts for the highest cause of death. Currently, the occurrence of cancer is increasing. Cancer has become the second cause of death in Malaysia (MAKNA, 2007).

Breast cancer is the most common form of cancer affecting women in Malaysia (MAKNA, 2007). There is about one in nineteen women in this country are at risk to have breast cancer, as compared to one in eight women in Europe and the United States. On the other hand, colorectal cancer is one of the most common malignancies in the world. In 2002, it was the top and third high frequently reported cancer in males and females respectively in West Malaysia. Chinese shows the highest reported incidence of colorectal cancer (MALAYSIAN ONCOLOGY SOCIETY, 2007)