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ANTI CANCER ACTIVITY OF PLANT EXTRACTS ON MDA-MB231

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PENGESAHAN

Dengan ini adalah disahkan bahawa projek yang bertajuk "ANTI CANCER ACTIVITY OF PLANT EXTRACTS ON MDA-MB-231" telah disiapkan serta dikemukakan kepada Jabatan Mikrobiologi oleh Seri Wahyuni Binti Yussoff (163384) sebagai syarat untuk kursus BMY 4999 projek.

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ABSTRACT

Local plants of *Annona squamosa* L., *Strobilanthes crispus, Cinnanomum iners, Premna cardifolia, Barringtonia racermosa* L., *Acalypha indica, Ipomoea aquatica, Gynura procumbers, Vigna unguiculata* L., *Piper betle* L. and *Piper nigrum* L. were selected for their potential anti-cancer property. The leaves of plants were extracted using methanol and tested on breast cancer cell, MDA-MB-231. The MTT cytotoxicity assay has been carried out to calculate the IC_{50}. The result shown *Annona squamosa* L. and *Piper betle* L. has potential anti cancer activity with IC_{50} of 500.234 µg/ml and 375.710 µg/ml respectively. Meanwhile, *Piper nigrum* L. was cytotoxic to Chang liver cell with IC_{50} of 721.770 µg/ml.

ABSTRAK

Tumbuhan-tumbuhan tempatan iaitu *Annona squamosa* L., *Strobilanthes crispus, Cinnanomum iners, Premna cardifolia, Barringtonia racermosa* L., *Acalypha indica, Ipomoea aquatica, Gynura procumbers, Vigna unguiculata* L., *Piper betle* L. dan *Piper nigrum* L.) telah dipilih untuk mengkaji potensi ciri anti-kanser. Daun tumbuhan-tumbuhan tersebut telah diekstrak dengan menggunakan metanol and diuji dengan sel kanser payudara, MDA-MB-231. Analisis MTT sitotoksik telah dijalankan untuk mengira IC_{50} (perencatan sel). Hasil kajian menunjukkan *Annona squamosa* L. and *Piper betle* L. mempunyai ciri anti-kanser yang berpotensi dengan IC_{50} 500.234 µg/ml dan 375.710 µg/ml. Sementara itu, *Piper nigrum* L. adalah sitotosik terhadap sel hati Chang dengan IC_{50} 721.770 µg/ml.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

In advanced world today, cancer has become the second highest factor contributed to the people deaths (Amin *et al*., 2009). The top cancer cases were breast cancer, lung cancer, colon or rectum cancer, stomach cancer and prostate cancer (Cragg and Newman, 2005). Cancer can be classified into two types which are benign and malignant. Benign cancer is normally referred to tumor. Uncontrollable growth of cancerous cells which affect the basal membrane, attack and invade surrounding tissue and may metastasize is known as malignant cancer (de Melo *et al*., 2011). Destruction of apoptotic mechanism is the crucial reason the normal cell transformed to cancerous cell (Hu and Kavanagh, 2003). Cancer also may be undefined and may refer to conditions such as hard swellings, abscesses, calluses, corns, warts, polyps and tumors. The symptoms mentioned before generally involve the skin, tangible or clear conditions and sometimes related to cancerous state (Cragg and Newman, 2005).

To overcome this disease, anti cancer agents and chemotheraphy are invented by scientists. Chemotherapy is treatment by using synthetic or natural agents to counter or stop the process of carcinogenesis (Sporn *et al*., 1976). The active agents may be extracted from plants, microorganisms or marine organisms and commonly altered to enhance the potent effect. The case of drug resistance is common in therapeutic field. Hence, many cytotoxic drugs are applied in combination to overcome this problem although it is still not thoroughly effective. So, the

researchers need to find some other ways to encounter this problem such as searching for other potential active compound available in nature.

In addition, the available drugs generally are not specific which lead to many side effects to the body (Ophardt, 2003). The main focus of chemotherapy is to lower or totally stop the growth level of cancerous cells which also affect the normal cells in the body. The cells that have rapid turnover such as hair, gastrointestinal and bone marrow cells regularly affected (Ophardt, 2003). This is the reason why the chemotherapy patients have common symptoms such as nausea and vomiting, loss of hair, digestive distress, pale skin and many more which can worsen the patient's health. Hence, the requirement to invent the effective but specific drugs is very significant.

The objectives of this experiment are:

1. To extract potential plants for anti-cancer activity
2. To determine the cytotoxicity of plant extract towards breast cancer cell line

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