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THE CYTOTOXIC EFFECT OF RED AND GREEN MALAYSIAN SEAWEEDS AGAINST LIVER CANCER CELL LINES (HepG2)

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ABSTRACT

In recent years, generally about 30,000 new compounds from marine natural products have been explored and identified. This number of findings reflected the great potential of marine natural products as a source of novel chemicals classes. Due to the efficacy limitation of the available anticancer drugs in liver cancer treatment, there is an urge to seek new candidate for alternatives drugs. In search for new source of active metabolites, marine endophytic fungi isolated from seaweeds were chosen to be further studied. Hence, in this study, three marine endophytic fungi (ED1, ED2 and UF) isolated from red (*Acanthophora spicifera* (M. Vahl) Borgesen) and green Malaysian seaweeds (*Chaetomorpha minima* F.S Collins & Hervey 1917) were grown on two types of media, PDA with 1% and 3% of artificial sea salt (PDA 1% and PDA 3%). Marine endophytic fungi extracts were investigated for their cytotoxic effect against HepG2 cells by using MTT assay. In this presence study, the lowest IC_{50} values were observed at 72 hours incubation times. Extracts with the IC_{50} values less than 50µg/ml [UF 1% (16.5± 1.5µg/ml), ED1 1% (36 ± 16.00µg/ml) and UF 3% (42.5± 12.5µg/ml)] were considered to have promising cytotoxic activity. Only one extract [UF 1% % (16.5± 1.5µg/ml)] showed active cytotoxic activity whereas two extracts [(ED1 1% (36 ± 16.00µg/ml) and UF 3% (42.5± 12.5µg/ml)] had moderate cytotoxic activity. As for salinity, endophytic fungi media supplemented with 1% artificial sea salt was sufficient in providing cytotoxic effect against HepG2 cells as compared to 3%. Therefore, the cytotoxic effects exhibited by these three extracts against HepG2 cells could be considered as suitable candidates for further studies as anticancer agents.

Keywords: Cytotoxic, seaweeds, marine endophytic fungi, HepG2.

CHAPTER ONE

INTRODUCTION

1.1 Background of study

Cancer is known as a second global leading cause of death after the cardiovascular disease (Bae et al., 2010). In year 2008, about 12.66 million people were diagnosed with cancer which reflects to 188 cases for every 100,000 people. Out of 12.66 million of cancer patients, about 7.56 million died due to the cancer complication. Lung, breast, colorectum, liver and stomach are the major cancer site that mostly occurred in Asian region for both sexes(UK cancer research, 2013). The cancer deaths are believed to be continuously increased with estimation, 13.1 million of deaths occur in 2030 (World Health Organization, WHO, 2013).

Cancer is a class of disease which characterized by the uncontrollable growth a group of cells, invasion and metastasis. These three properties help in differentiating them from benign tumors, which are self-limited and do not invade or metastasized (Dhorajiya et al., 2012). Currently, many treatments have been implemented to control the uncontrollable growth of cancer cells. The recommended treatments for cancer patients are depending on the types and stages of cancers. Chemotherapy is