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CYTOTOXIC EFFECTS OF MARINE ENDOPHYTIC FUNGI EXTRACTS AGAINST MELANOMA (CRL6475) CANCER CELLS

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ABSTRACT

Melanoma has showed rapid incidence rate and associated with multi-drug resistant resulting in high mortality rate. Thus, immediate search for new compounds that has potential in treating resistant melanoma are needed. Endophytes produce enormous amount of active metabolites, especially fungal endophytes. Marine endophytic fungi are proven to have great bioactivity. In this study, endophytic fungi extracted from seaweeds was used to investigate its cytotoxic effects against melanoma cancer cells (CRL-6475). These marine endophytic fungi (*Gracilaria arcuata Zanardini* : MV, *Gracilaria coronopifolia J. Agard* : CN, and *Acanthophora spicifera*:ED) were extracted from local seaweeds at Port Dickson, Negeri Sembilan. Marine endophytic fungi (CN, MV & ED) were grown for one month on PDA supplemented with 1% artificial sea salts. Ethyl acetate extraction method had been used to obtain the extracts. Five different concentrations (0.01 µg/ml, 0.1 µg/ml, 1.0 µg/ml, 10 µg/ml, and 100 µg/ml) were used for each of the extracts for 24 hours. The cytotoxic activity were measured by using MTT assay. The results in express in IC_{50} values. The three marine endophytic fungi showed inhibition against melanoma cells with different IC_{50} values which is 534.55 µg/ml, 251.79 µg/ml and 171.16 µg/ml for MV, ED and CN respectively. CN extract had the lowest IC_{50} value followed by ED and MV. Despite the high value of IC_{50} further study should be done to obtain additional information about these endophytic fungi extracts.

CHAPTER 1: INTRODUCTION

1.1 : Background of Study

Endophytes are microorganisms that reside underneath epidermal cell layers of hosts without causing any harm or apparent symptoms to the host (Kharwar et al., 2011). These microorganisms produce enormous amount of active metabolites, especially fungal endophytes. (Kaul et al., 2012). Thus, the emergence of endophytes as new alternatives in finding lead compounds has tremendously increased especially this past five years. However, many of these compounds are still undiscovered (Kaul et al., 2012). Endophytes comes from different variety of sources. Seaweeds are one of the examples of fungal endophytes sources. Marine endophytes isolated from seaweeds exhibit great bioactive activities such as anticancer, anti-microbial, and antioxidants with different potency (Debbab et al., 2011; Kaul et al., 2012) (Gomes et al., 2015).

In this study, endophytic fungi extracted from seaweeds will be used to investigate its cytotoxic effects against melanoma cancer cells (CRL6475). These marine endophytic fungi (*Gracilaria arcuata Zanardini* : MV, *Gracilaria coronopifolia J. Agard* : CN, and *Acanthophora spicifera* : ED) were extracted from local seaweeds at Port Dickson, Negeri Sembilan. All the seaweeds belonged to Rhodophyta phylum or commonly known as red seaweeds. Local seaweeds are chosen because it has high potentials as bioactive metabolites. Based on previous studies, these endophytic fungi extracts showed good activity against liver cancer cells (CRL5978), lung cancer cells (CRL5837) and colon cancer cells (CRL2579). Thus, the aims of this study is to further