

UNIVERSITI TEKNOLOGI MARA

**DIFFERENTIAL CYTOTOXICITY OF ETHYL
ACETATE EXTRACTS OF MALAYSIAN
MARINE ENDOPHYTIC FUNGI (MBS3.2 AND
SM1.4 PLATE 1) AGAINST HUMAN BREAST
CANCER CELL LINES**

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ABSTRACT

Endophytes-derived metabolites, which are known to exhibit anticancer and antimicrobial activities, are progressively becoming significant in discovery of novel drugs. Given the abundance of unexplored Malaysian endophytes within marine plants, this study was carried out to assess the cytotoxic profiles of ethyl acetate endophytic fungal extracts MBS3.2 (originated from *Sonneratia* sp.) and SM1.4 PLATE 1 (originated from sea mud) against human breast cancer cells. The fungal cultures were first examined using gross observation and ESEM. The cultures were then extracted using rotary evaporator. The resultant extracts (0.01 - 100 $\mu\text{g/mL}$) were tested against MCF7 (ER positive breast cancer cells) and MDA468 (ER negative breast cancer cells) for 72 h. SRB assay was performed and data generated was used to plot dose-response curve from which the IC_{50} (concentration that inhibit 50% cells population) was obtained. The present found MBS3.2 and SM1.4 PLATE 1 to be more selective towards MCF7. They were, however, modest cytotoxic agents against human breast cancer cells, yielding $\text{IC}_{50} > 20\mu\text{g/mL}$. This warrants future studies against other cancer types.

Chapter 1

Introduction

1.1 Background of study

Breast cancer refers to tumour that arises from the cells of the breast (Kenny, 2014). It commonly affects women. In the United States of America, over 200,000 new cases of breast cancer are diagnosed each year (Roberts, 2015). In Malaysia, the incidence rate of breast cancer is estimated at one in twenty women. Nevertheless, the actual incidence rate of breast cancer could be higher as there are some Malaysian women who rely on traditional medicine as their primary treatment (Kaur, 2013). To date, the actual cause of breast cancer remained unknown.

Advanced stage breast cancer is commonly treated with chemotherapy and hormonal therapy. Whilst cytotoxic drugs commonly used in chemotherapy include doxorubicin, anthracycline and cyclophosphamide, hormonal therapy involves the use of fluorouracil, anastrozole and tamoxifen. Chemotherapy and hormonal therapy, however, exhibit negative impact against rapidly dividing normal cells. This in turn gives rise to undesirable side effects like alopecia, nausea, vomiting and heart damage. Besides, the tumour exposed to