UNIVERSITI TEKNOLOGI MARA

ENHANCEMENT OF METABOLITE PRODUCTION FROM HAB21 F23 AN ENDOPHYTE

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ABSTRACT

An endophyte HAB21 F23 used in this study was grown in various culture conditions and the extracts were tested for antimicrobial and cytotoxic activity. The parameters that were used in this study include different form (solid, liquid) of potato dextrose media at different incubation period (one, two and four weeks), water source (tap water, deionized water) of solid and liquid potato dextrose media and 1/5 diluted solid and liquid potato dextrose media. Extracts of HAB21 F23 grown in various culture conditions exhibited considerable differences in cytotoxic activity when tested *in vitro* against colon cancer (HT29) cell lines and normal embryonic liver (WRL68) cell lines using the MTT assays. The results from the present study showed that among the solid media, PDA2 was the most potent with an IC_{50} value of 3.57 µg/ml and among the liquid media, 1/5PDB was the most potent towards HT29 cell lines with an IC_{50} value of 0.43 µg/ml. However, the HAB21 F23 extract was potent also against the cell lines WRL68, showing that it was not selective against cancer and normal cell lines. The HAB21 F23 extracts were also tested for antimicrobial activity against pathogenic fungi (*Candida albicans, Aspergillus niger*), and bacteria (*Staphylococcus aureus, Bacillus subtilis, E. coli, Micrococcus luteus*) using disc diffusion method but results from this study revealed that the endophyte HAB21 F23 showed no antimicrobial activity.

CHAPTER 1

INTRODUCTION

Natural products are naturally derived metabolites from plants, marine and microorganisms (Baker, 2000). Plants are the main source for most of the drugs in use today and have produced about 20,000 microbial secondary metabolites but only a small proportion of these secondary metabolites are used in production of natural drugs (Bode et al., 2000). Taxol is an example of drugs from the natural origin which is found in many species of the plants Western yew (Taxus *brevifolia*) and the European yew (*Taxus baccata* (Strobel and Daisy, 2003). Marine macro- or microorganisms have proven to be a source of biologically active natural products (Blunt, 2005). Marine sponges constitute the main source of bioactive secondary metabolites from the marine environment (Oliviera, 2006). More than 16000 marine natural products are discovered so far and two marine drugs that are commercially available are acyclovir and zidovudin (Tor Haug, 2000). Microorganisms represent a large source of biologically active metabolites among known producers of small molecule natural products which has broad applications as antibiotics, immunosuppressants, antiparasitics, agrochemicals and anticancer agents (Gunatilaka, 2005).