

UNIVERSITI TEKNOLOGI MARA

**THE POTENTIAL OF MARINE ENDOPHYTE
FUNGI EXTRACTS IN PREVENTION OF UVB
IRRADIATION AGAINST FIBROBLAST CELL
LINES**

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ABSTRACT

Ultraviolet radiation, particularly UVB (290-320 nm) is the major causes of many harmful effects, including photoaging, cutaneous inflammation, sunburn, skin cancer as well as able to cause protein oxidation, cellular and DNA damages. Photochemoprevention by using natural antioxidant in protecting human skin against UVB damage is receiving increased attention. Therefore, in this study, the effect of marine endophytic fungi (MV, CN and ED) that colonise in local seaweeds (*Gracilaria coronopifolia* J. Agard, *Gracilaria arcuata* Zanardini, and *Acanthophora spicifera*) respectively on UVB induce damage of human fibroblast BJ cell lines were investigated. At density of 2×10^4 of fibroblast BJ cell lines were seeded on 96 well plate in triplicate manner. The cell lines were exposed to the UVB radiation for 60 seconds in order to induce DNA damage and were tested using different concentrations of marine endophytic fungi extracts were added in each wells for 24 hours. For photoprotective activity, the cell lines were treated with different concentration of extracts and then exposed to UVB radiation. From this study, the result exhibited no photoprotective and reduce DNA damage effects against fibroblast BJ cell lines as 60 seconds of UVB irradiation time exposure were inadequate to damage fibroblast BJ cell lines. Therefore, the ability of these three marine endophytic fungi extracts which were CN, MV and ED in reducing and exhibited were unable to be proven in this study.

Keyword: fibroblast BJ cell lines, marine endophytic fungi, photoprotective effect, reduce DNA damage effect, ultraviolet B.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Sun is the main source of UV radiations and it can be divided into three categories based on their wavelength; UVA (320-400 nm), UVB (290-320 nm) and UVC (200-290 nm). UVB radiation is the most dangerous to human health (Brul et al., 1984) as it became the main source of skin damage such as premature skin aging, wrinkles, hardening of the skin, sunburn, hyperpigmentation, DNA and cellular damages, oxidative stress, tissues injuries and skin cancer (Afaq et al., 2009). UVB radiation is able to induce the formation of lesions in DNA; Cyclobutane Pyrimidine Dimers (CPDs), Pyrimidine (6-4) Photoproducts (6-4PPs) and Dewar Photoproducts (Dewar PPs) (Beani, 2014) which can alter, distort and damage the DNA structures.

Marine endophytic fungi represent any fungi that colonise in the internal tissues of marine plants without causing any harm to the hosts. Marine endophytic fungi have been proven to produce many active secondary metabolites such as azaphilone derivative, penicilazaphilones, isocoumarin, indoloditerpenes, terpeptine analogue and many more that still not been discovered. These compounds were tested and showed properties in radical scavenging,