UNIVERSITI TEKNOLOGI MARA

INVESTIGATION OF THE SECONDARY METABOLOME OF FUNGI FROM SVALBARD ISLANDS

(CHEMISTRY OF PSYCHROPHILIC FUNGI)

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ABSTRACT

Psychrophilic fungi are believed to produce secondary metabolites. Secondary metabolites such as mycotoxins have an important ecological function. The main objectives of the study is to gain HPLC profiling of the extracts produced by 8 strains of psychrophilic fungi. They were grown in 96-well microtiter plate (MTP). All strains grew well and the extracts were analyzed by High Performance Liquid Chromatography (HPLC). Further study needs to be done to identify the metabolites and compounds of interest for these fungi.

CHAPTER 1

INTRODUCTION

1.1 Background of study

An extremophile is a microorganism that survives in physically extreme conditions and all possible habitats. Microorganisms such as fungi, are able to proliferate at various extreme habitats such as dry rock surfaces (Steflinger., 1998), ocean depths (Lopez-Garcia *et al.*, 2001) and hypersaline waters (Gunde-Cimerman *et al.*, 2000). There are many types of extremophiles including psychrophiles (organisms that survive at low temperature), barophiles or piezophiles (organisms that grow at high pressures), hyperthermophiles and thermophiles (organisms that survive at very high or high temperatures, respectively), alkaliphiles and acidophiles (organisms that optimally sustained to basic or acidic pH values, respectively), and halophiles (organisms that thrive in salt-rich environment). Psychrophilic fungi would constitute the group of specific interest for this project .

Psychrophilic fungi have the capacity to grow at extremely cold environment. They include organisms surviving in vegetation, permafrost, snow, glacial ice habitats (-5°C), Antarctic and Arctic (-1 to -35°C) or even deeper ocean (-1 to 4°C) (Singh et al., 2006, Gundecimerman et al., 2003). Psychrophiles are of two types, for example obligate and facultative psychrophiles. Obligate psychrophiles are organisms that survive at temperature less than 15°C. They are mostly found in icy places such as