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EFFECT OF CULTURE CONDITION ON METABOLITE USING OSMAC APPROACH PRODUCED BY ENDOPHYTIC STRAIN (4PL2)

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ABSTRACT

The study was done to identify the effect of culture condition on metabolite production by fungal strain 4PL2. fungi strain 4PL2 was isolated from plant of Pandanus herbaceous which was collected from Port Dickson, Negeri Sembilan in 2006. the study was performed by growing the pure culture of fungi strain 4PL2 in different media, different strength and different incubation period. The pure culture of 4PL2 was then incubated for 2 weeks, 3 weeks and 4 weeks. Then the myceliums of fungi strain 4PL2 were subjected to extraction process by using ethyl acetate as a solvent. After obtaining the pure extracts, then subjected to antimicrobial assay by using disc diffusion method. Three bacteria and two fungi have been used to assay the extract for antimicrobial activity and the result has been recorded. Consequently, the extract was analyzed using HPLC chromatogram to detect the production of major and minor metabolites for different media, different strength and different incubation period. All the data and information obtained from the observations, weight of extracts, microscopic pictures, antimicrobial test and HPLC chromatograms analysis were collected and recorded.

CHAPTER 1

INTRODUCTION

1.1 General Introduction

Plant associated microorganism represent a largely untapped resource of small molecules of natural products, some with chemical structure that have been optimized by co-evolution for biological and ecological relevance. According to Chin Y. W. 2006, Berdy J. 2005, nature has been a source of numerous medicines for treating various types of disease in human and animals for many years. An increasing number of metabolites from natural sources have been discovered by the application of biochemical assays that are used to identify metabolites in an extract exhibiting a particular biochemical activity. In this way, biological activities other than antibiotic properties have been recognized for many compounds (Sivasithamparam & Ghisalberti 1998).

Natural products are naturally derived metabolite and by product for microorganism, plants and animals. This products still play role in therapeutic either as active ingredient or as a source for synthesis or design of the agent. However not all natural product can be fully synthesized since they have very complex structure that are difficult and expensive on industrial scale.

Bioactive secondary metabolites

According to Demain AL, Fang A., 2000, secondary metabolites are a heterogeneous group of natural compounds that are considered to aid the producing organism in survival and basic functions, such as competition, symbiosis, metal transport, differentiation, etc. Lu, et al, 2000, stated that plant, microorganism and marine microorganism secondary metabolites represent a tremendous resource for scientific and clinical research and new drug development. Accordingly, many secondary metabolites tend to be compounds that have toxic or inhibitory effects on other organisms. Because of these bioactive properties, many fungal secondary metabolites have been adopted by humans for use as pharmaceuticals such as antibiotics, cholesterol-lowering agents, tumor inhibitors, and immunosuppressants for transplant operations. Other natural products of fungi have negative impacts on society, including phytotoxins and mycotoxins produced by plant pathogenic fungi and enhancers of virulence in fungal pathogens of humans and other animals.

Culture condition

Microbes are vast and largely untapped resources of novel, structurally diverse metabolites. Many of these metabolites possess highly valuable bioactivities to humans. In general, metabolite biosynthesis in microbes is tightly controlled by regulatory