UNIVERSITI TEKNOLOGI MARA

TLC SCREENING FOR FREE RADICAL SCAVENGER AND POLYPHENOLIC ANTIOXIDANT IN MARINE ALGAE

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ABSTRACT

The aim of the study is to quantify the polyphenolic content and free radical scavenging activity in various species of marine algae. Due to presence of antioxidant and free radical scavenger, marine algae can thrive the extreme environmental condition where exposure to extreme light and high concentration of oxygen. Polyphenolic compound which is secondary metabolite of algae has free radical scavenging potential. Phenolic compound can act as reducing agent, hydrogen (H) donor, singlet oxygen (O) quencher that can decrease the formation of reactive oxidative species (ROS). In *vivo*, ROS might cause harm by damaging cellular components. HPTLC with post-derivatization with DPPH• of $FeCl_3$ can be used as method to analyse the total phenolic content and free radical scavenging capacity. This research show that high correlation ($r = 0.68$) between polyphenolic content and free radical scavenging activity. This correlation suggest that polyphenolics mostly contribute to free radical scavenging activity.

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TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Generally, algae are photosynthetic organisms which are represented as eukaryotic, although prokaryotic cyanobacteria often included in algae classes (Ramanan, Kim, Cho, Oh, & Kim, 2016). Most algal divisions refer to color such as brown, red, green or blue-green. These variation of colors are due to presence and different proportions of pigment in the cell (Vassilev & Vassileva, 2016).

Algae had been consumed since ancient time. In recent years, a lot of research about algae had been made to develop new drugs and health food (Kuda, Tsunekawa, Goto, & Araki, 2005). Algae are containing rich of dietary fibers, essential amino acids, minerals, vitamins such as vitamin A, B_1, B_2 and C. Apart from that, algae are also known to have rich sources of antioxidants (Machu et al., 2015; Nagai & Yukimoto, 2003).

Marine algae have unique physiology and biochemical properties. They are able to grow in extreme environment, where are extreme light exposure and extreme oxygen concentration. This condition leads to formation of reactive oxygen species (ROS) such as superoxide radical (O_2^-•), the hydroxyl radical (OH•) and peroxyl