



Microalgae as Potential Anti-Inflammatory Natural Product Against Human Inflammatory Skin Diseases

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The skin is the first line of defense against pathogen and other environmental pollutant. The body is constantly exposed to reactive oxygen species (ROS) that stimulates inflammatory process in the skin. Many studies have linked ROS to various inflammatory skin diseases. Patients with skin diseases face various challenges with inefficient and inappropriate treatment in managing skin diseases. Overproduction of ROS in the body will result in oxidative stress which will lead to various cellular damage and alter normal cell function. Multiple signaling pathways are seen to have significant effects during ROS-mediated oxidative stress. In this review, microalgae have been selected as a source of natural-derived antioxidant to combat inflammatory skin diseases that are prominent in today's society. Several studies have demonstrated that bioactive compounds isolated from microalgae have anti-inflammation and anti-oxidative properties that can help remedy various skin diseases. These compounds are able to inhibit production of pro-inflammatory cytokines and reduce the expression of inflammatory genes. Bioactive compounds from microalgae work in action by altering enzyme activities, regulating cellular activities, targeting major signaling pathways related to inflammation.

Keywords: microalgae, bioactive compounds, anti-inflammation, anti-oxidant, skin disease

INTRODUCTION

The skin is the outermost layer and considered the largest organ in the human body. It plays an important protective role by providing a major boundary between the host and the external environment (Benson and Watkinson, 2012). The skin is also well equipped with effective defenses against pathogens and other environmental pollution (Wang H. et al., 2013). Exogenous threats such as UV radiation and oral introduction of potentially toxic dietary and drug metabolites, all of these factors may influence the health and appearance of the skin (Sander et al., 2004). The body