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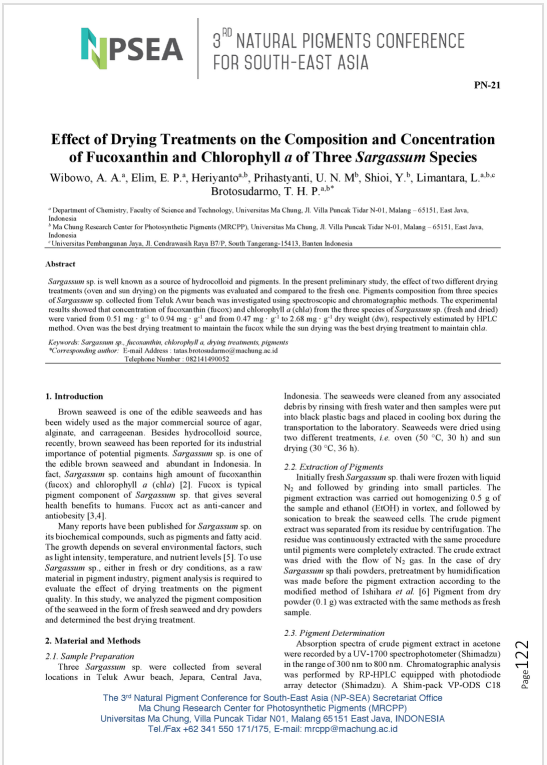

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PN-21

Effect of Drying Treatments on the Composition and Concentration of Fucoxanthin and Chlorophyll *a* of Three *Sargassum* Species

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Abstract

Sargassum sp. is well known as a source of hydrocolloid and pigments. In the present preliminary study, the effect of two different drying treatments (oven and sun drying) on the pigments was evaluated and compared to the fresh one. Pigments composition from three species of *Sargassum* sp. collected from Teluk Awur beach was investigated using spectroscopic and chromatographic methods. The experimental results showed that concentration of fucoxanthin (fucox) and chlorophyll *a* (*chla*) from the three species of *Sargassum* sp. (fresh and dried) were varied from 0.51 mg · g^{-1} to 0.94 mg · g^{-1} and from 0.47 mg · g^{-1} to 2.68 mg · g^{-1} dry weight (dw), respectively estimated by HPLC method. Oven was the best drying treatment to maintain the fucox while the sun drying was the best drying treatment to maintain *chla*.

Keywords: Sargassum sp., fucoxanthin, chlorophyll a, drying treatments, pigments
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1. Introduction

Brown seaweed is one of the edible seaweeds and has been widely used as the major commercial source of agar, alginate, and carrageenan. Besides hydrocolloid source, recently, brown seaweed has been reported for its industrial importance of potential pigments. *Sargassum* sp. is one of the edible brown seaweed and abundant in Indonesia. In fact, *Sargassum* sp. contains high amount of fucoxanthin (fucox) and chlorophyll *a* (*chla*) [2]. Fucox is typical pigment component of *Sargassum* sp. that gives several health benefits to humans. Fucox act as anti-cancer and antiobesity [3,4].

Many reports have been published for *Sargassum* sp. on its biochemical compounds, such as pigments and fatty acid. The growth depends on several environmental factors, such as light intensity, temperature, and nutrient levels [5]. To use *Sargassum* sp., either in fresh or dry conditions, as a raw material in pigment industry, pigment analysis is required to evaluate the effect of drying treatments on the pigment quality. In this study, we analyzed the pigment composition of the seaweed in the form of fresh seaweed and dry powders and determined the best drying treatment.

2. Material and Methods

2.1. Sample Preparation

Three *Sargassum* sp. were collected from several locations in Teluk Awur beach, Jepara, Central Java, Indonesia. The seaweeds were cleaned from any associated debris by rinsing with fresh water and then samples were put into black plastic bags and placed in cooling box during the transportation to the laboratory. Seaweeds were dried using two different treatments, *i.e.* oven (50 °C, 30 h) and sun drying (30 °C, 36 h).

2.2. Extraction of Pigments

Initially fresh *Sargassum* sp. thali were frozen with liquid N_2 and followed by grinding into small particles. The pigment extraction was carried out homogenizing 0.5 g of the sample and ethanol (EtOH) in vortex, and followed by sonication to break the seaweed cells. The crude pigment extract was separated from its residue by centrifugation. The residue was continuously extracted with the same procedure until pigments were completely extracted. The crude extract was dried with the flow of N_2 gas. In the case of dry *Sargassum* sp thali powders, pretreatment by humidification was made before the pigment extraction according to the modified method of Ishihara *et al.* [6] Pigment from dry powder (0.1 g) was extracted with the same methods as fresh sample.

2.3. Pigment Determination

Absorption spectra of crude pigment extract in acetone were recorded by a UV-1700 spectrophotometer (Shimadzu) in the range of 300 nm to 800 nm. Chromatographic analysis was performed by RP-HPLC equipped with photodiode array detector (Shimadzu). A Shim-pack VP-ODS C18

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