



Effects of Solvent Extraction and Drying Methods of Malaysian Seaweed, *Sargassum polycystum* on Fucoxanthin Content

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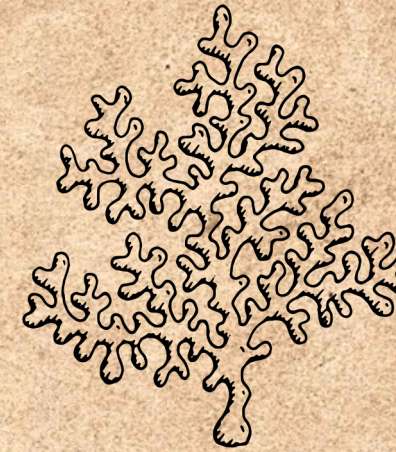
Introduction

RESEARCH BACKGROUND



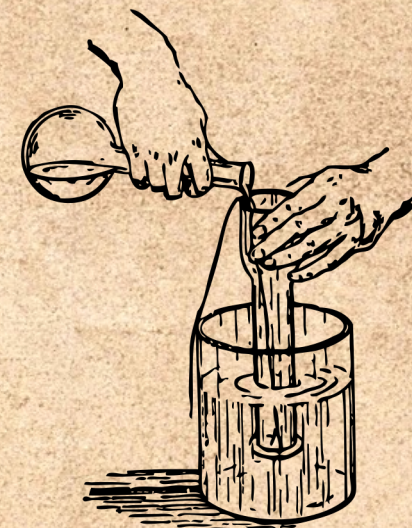
MALAYSIAN SEAWEED

186 genera Rhodophyta (red seaweed)
105 genera Chlorophyta (green seaweed)
73 genera Phaeophyta (brown seaweed)
17 genera Cyanophyta (blue-green seaweed)



BROWN SEAWEED, SARGASSUM SP.

Phaeophyta group
Brown, olive or yellowish-brown hues



FUCOXANTHIN

Orange-coloured pigment
Antioxidant



Purpose

RESEARCH OBJECTIVES

To evaluate the effect of different extraction solvents and drying processes on the fucoxanthin content in *S. polycystum*.

To identify the best extraction solvents and drying processes that give the higher content of fucoxanthin in *S. polycystum*.

Hypothesis

RESEARCH HYPOTHESIS

The different extraction solvents and drying processes will affect the content of fucoxanthin in *S. polycystum*.

Air-drying method will have higher extraction yield of fucoxanthin content in *S. polycystum*.

Methodology

RESEARCH METHOD AND PROCEDURE

COLLECTION OF SEAWEED

Blue Lagoon, Port Dickson, Negeri
Sembilan, Malaysia
February 2021

PREPARATION OF DRIED SAMPLE

Air-drying
Sun-drying

EXTRACTION PROCESS OF FUCOXANTHIN

5 g of powdered *S. polycystum*
50 mL of solvent
40 °C for 24 hours
solid-to-solvent ratio (1:10 (w/v))

Methodology

CONT ...

EXTRACTION PROCESS OF FUcoxANTHIN

Water bath shaker under dim
light
Repeated twice using the same
residue
Dried using rotary evaporator

HPLC ANALYSIS

Injection volume (5 mL)
C-18 reverse phase column
Methanol:acetonitrile:water
(70:20:10 v/v)
Flow rate (1.5 mL/min)
Wavelength (450 nm)

STATISTICAL ANALYSIS

One-way Analysis of variance
(ANOVA)
Duncan post hoc test
IBM SPSS Statistics version 26

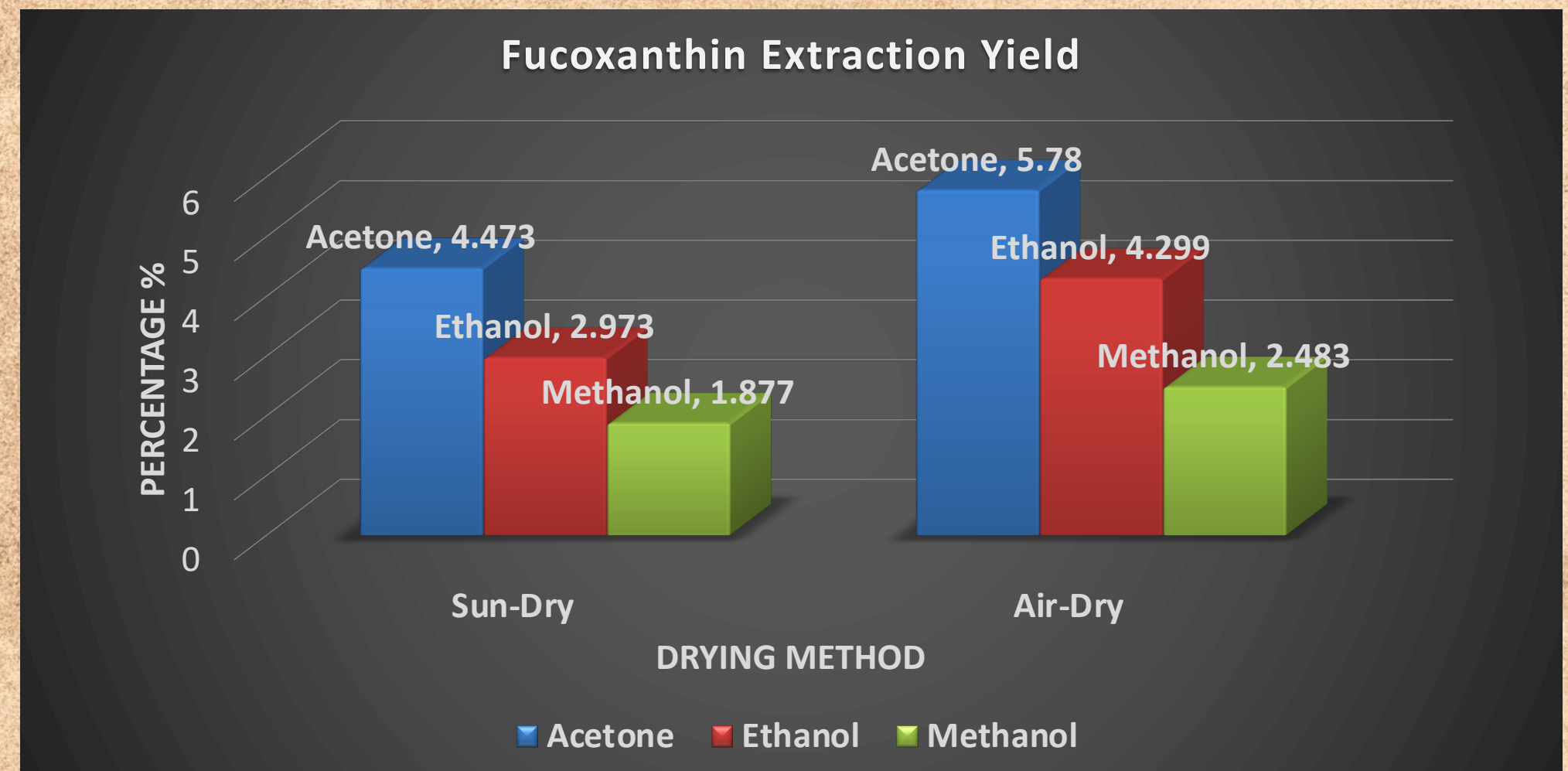
Key Findings

RESEARCH RESULTS AND DISCUSSION

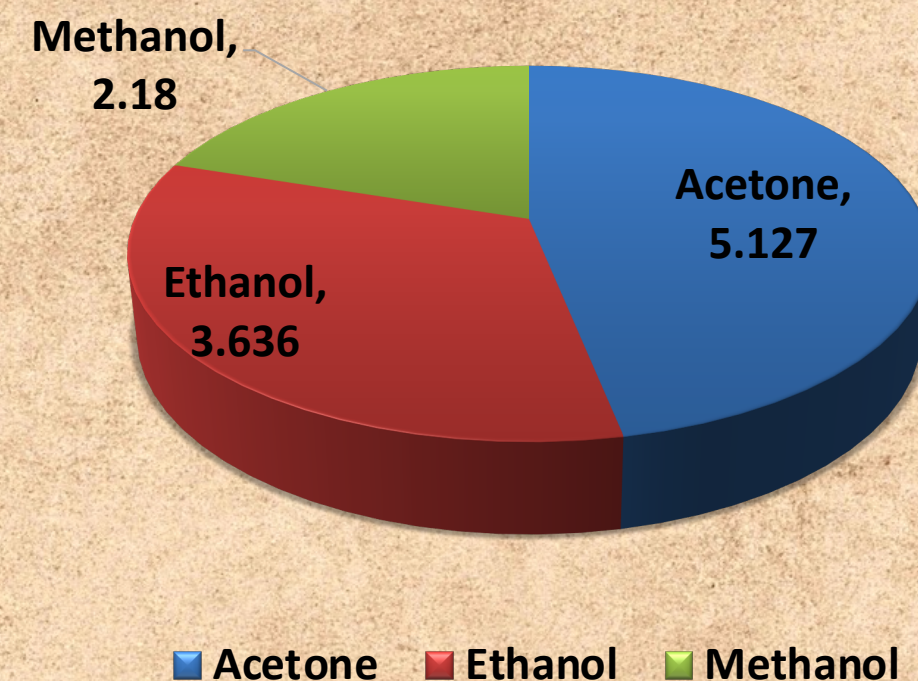
Fucoxanthin Extraction Yields

Extraction Solvents	Average Extraction Yield (%)	
	Sun-drying	Air-drying
Acetone	4.473 ± 0.58 ^{aA}	5.780 ± 0.78 ^{aB}
Ethanol	2.973 ± 0.58 ^{bB}	4.299 ± 0.92 ^{bC}
Methanol	1.877 ± 0.17 ^{cD}	2.483 ± 0.23 ^{cD}

- Values are expressed in mean ± SD, n=3 with different lowercase superscript letters within the same column are significantly different ($p < 0.05$).
- Values are expressed in mean ± SD, n=3 with different uppercase superscript letters within the same row are significantly different ($p < 0.05$).



Fucoxanthin Average Percentage Yield Based on Different Solvent



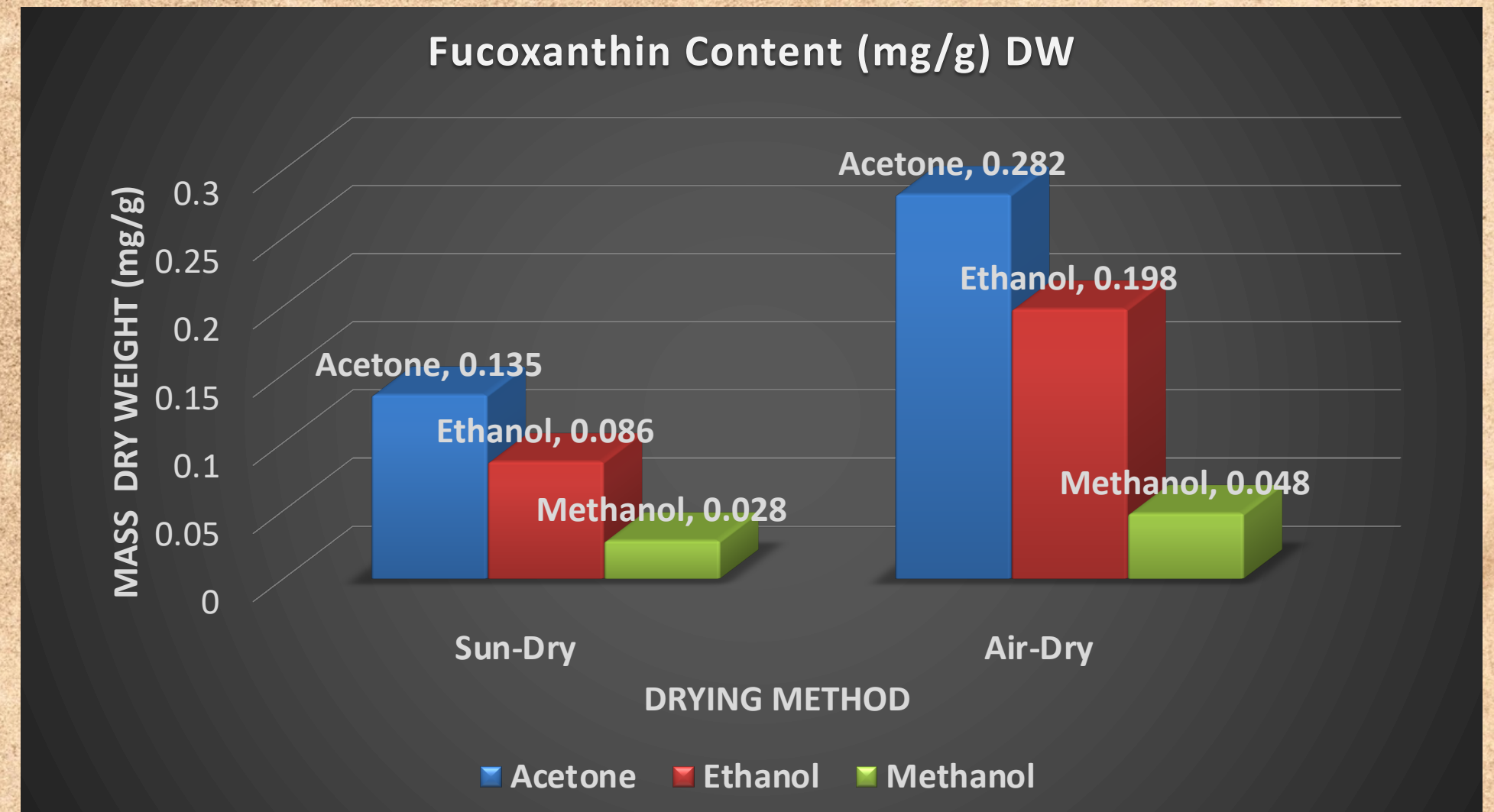
Key Findings

CONT ...

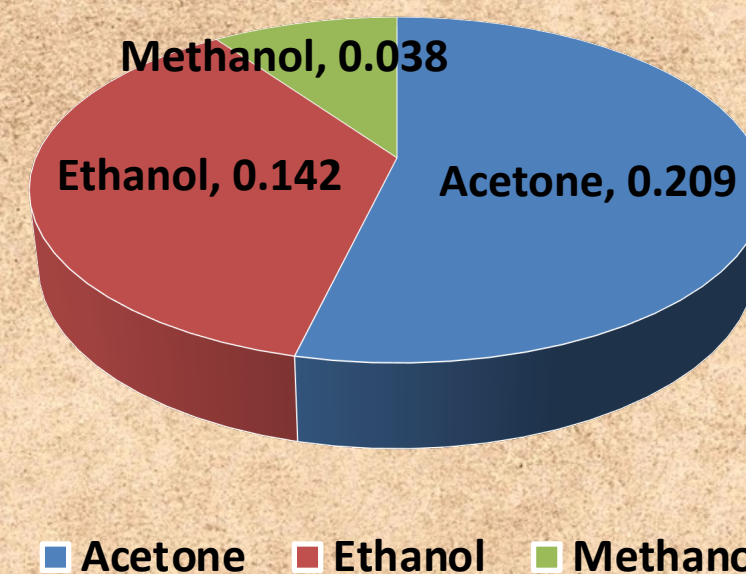
Fucoxanthin Content

Extraction Solvents	Fucoxanthin Content (mg/g DW)	
	Sun-drying	Air-drying
Acetone	0.135 ± 0.03 ^{aA}	0.282 ± 0.08 ^{aB}
Ethanol	0.086 ± 0.05 ^{abB}	0.198 ± 0.13 ^{abC}
Methanol	0.028 ± 0.02 ^{bD}	0.048 ± 0.01 ^{bD}

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Average Fucoxanthin Content (mg/g) Based on Different Solvent



Implications

FOR PRACTICE, RESEARCH
AND THEORY

Benefit to the community in the production of high fucoxanthin content from *S. polycystum* extract for development of cosmetic and nutraceutical products.

Futures research could be carried out in future by interest parties regardless of research area.

Identifying the appropriate extraction solvents and drying process of fucoxanthin content with high yield will give more advantages to fellow researchers





Originality and Value



Studies on the effects of different drying methods (sun-drying and air-drying) and extraction solvent (acetone, ethanol and methanol) towards the fucoxanthin content in Malaysian brown seaweed, *Sargassum polycystum*

Analysis using one-way analysis of variance (ANOVA)

Research Limitation

SAMPLE COLLECTION

Geographical factors (one location investigation)

Seasonal factors

Seaweed species



PARAMETER

Limited parameter (Drying method and solvent extraction)

