



# THE STABILITY TEST ANTHOCYANIN PIGMENT OF EXTRACT FROM RED SPINACH LEAVES (*Alternanthera amoena* Bac.)

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**Abstract** – Anthocyanins are natural pigments found in many fruits, plants and flowers colors of orange, red, purple and blue. Anthocyanin pigment includes various flavonoid groups and it is soluble in water. The stability of anthocyanin pigment is heavily affected by physical and chemical aspects like pH and temperature, and is generally more stable on acid condition.

The purpose of this research is to determine the type of anthocyanin pigments in red spinach leaves, knowing the effect of different pH, temperature and duration of heating on the stability of anthocyanin extract from red spinach leaves.

The type of the pigment was identified with a group functions with FTIR (Fourier Transform Infrared). The next research was to test stability of the pigment against treatment or factor difference of pH much as 7 levels (2,25;3,25;4 and 4,25) and treatment of heating as much as 3 levels (temperature 50° C for 60 minute, 70° C for 30 minute and 100° C for 15 minute). The results showed that the anthocyanin of red spinach leaves is malvidin 3.5 diglukosida, with 22.59 absorbance at  $\lambda$  519 nm, pH of 2.60, color intensity (L 43.67,a\*20,7, b\*20,6), total dissolved solids is 5.8 Brix, the anthocyanin content of 18.94 mg / ml and the yield of 15.16%. The pigment concentrates were more stable at pH 2,25; 4,0, and 4,25 with each absorbance value 0,73; 0,77; 0,74, while the powdered pigment was more stable at pH 2,25, the highest absorbance value of 0,44. Temperature and long heating have effect to absorption and level of redness (a\*) pigment extract from red spinach leaves. The pigment concentrate of red spinach leaves were more stable than pigment powder. Temperature treatment on 50° C (60 minute) decreased minimum with percentage decreased absorption 31,3 % and decrease in redness value of 0,51 to 0,42.

**Keywords:** spinach red leaves, anthocyanin pigment, stability, difference

## INTRODUCTION

Color in food is one of the important factors to determine whether food or beverages may be accepted and rejected by consumers. Consumers also expect a good display of color and flavor foods or beverages they consume, so the color of the food products can be the attraction of the product.

The addition of food coloring in general, can be used with various purposes ie improve visibility of food color fading due to heat or fading process to provide visibility for keeping the dull color of the product, and provide a more uniform appearance of the product so as to improve the quality of the food and drink.

Anthocyanins are natural pigments found in many fruits, plants and flowers. Anthocyanins produce colors of orange, red, purple and blue. Anthocyanin pigment include various flavonoid groups and it is soluble in water. The stability of anthocyanin pigment is heavily affected by physical and chemical aspects like pH and temperature, and is generally more stable on acid condition.

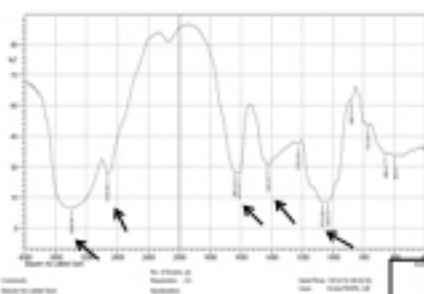


## EXPERIMENTAL SETUP

Raw materials to be used are red spinach leaves obtained in the Stone. The chemicals used for the extraction and analysis process is distilled water, citric acid, petroleum ether, a solution of K-Phthalat buffer, citrate buffer, dextrin.

The equipment used in this study include crusher (blender), rlenmayer, test tubes, beakers, measuring pipette, suction pumps, bottles, stealer, refrigerators, tube rack, analytical balance, centrifuge, 41 whatman paper, vacuum filter, rotary evaporator, spectrophotometer UV-1601, pH meter, colorimeter / color reader CR-10, mixer, oven and other tools.

## RESULT - 1



The type of the pigment was identified with a group functions with FTIR (Fourier Transform Infrared).

The results showed that the anthocyanin of red spinach leaves is malvidin 3.5 diglukosida, with 22.59 absorbance at  $\lambda$  519 nm

Daerah	Frekuensi	Tipe Sinyal	Endapan
C-H	1021 - 1004	Cole	1022,70
C-OH	1000 - 1200	Alkohol	1022,70
-OH	1372 - 1400	Alkal	1423,27
C-OOH	1672 - 1700	Alkohol (sifat gliserol)	1703,23
C-O-C-O-C-OH	1000 - 1100	Lipid	1022,70

## RESULT - 2

Treatment	Absorbansi (galat.120 nm)	
	100 x ekstrak essensial	10 x ekstrak pigmen powder
pH 2	0,63 a	0,20 a
pH 2,25	0,72 ab	0,44 b
pH 3	0,67 a	0,22 a
pH 3,25	0,61 a	0,24 a
pH 4	0,68 ab	0,27 a
pH 4,25	0,74 ab	0,22 a



Terdapan	Absorbansi (galat.120 nm)	
	100 x ekstrak essensial	10 x ekstrak pigmen powder
Temperatur 50° C (60 minute)	0,67 a	0,22 a
Temperatur 70° C (30 minute)	0,23 b	0,22 b
Temperatur 100° C (15 minute)	0,24 a	0,17 a
Terdapan	0,21	0,12

## DISCUSSION - 1

The results showed that the anthocyanin of red spinach leaves is malvidin 3.5 diglukosida, with 22.59 absorbance at  $\lambda$  519 nm, pH of 2.60, color intensity (L 43.67,a\*20,7, b\*20,6), total dissolved solids is 5.8 Brix, the anthocyanin content of 18.94 mg / ml and the yield of 15.16%. The pigment concentrates were more stable at pH 2,25; 4,0, and 4,25 with each absorbance value 0,73; 0,77; 0,74, while the powdered pigment was more stable at pH 2,25, the highest absorbance value of 0,44.

## DISCUSSION - 2

Temperature and long heating have effect to absorption and level of redness (a\*) pigment extract from red spinach leaves. The pigment concentrate of red spinach leaves were more stable than pigment powder. Temperature treatment on 50° C (60 minute) decreased minimum with percentage decreased absorption 31,3 % and decrease in redness value of 0,51 to 0,42.



## Conclusions

1. The results analysis FTIR showed that the anthocyanin of red spinach leaves is malvidin 3.5 diglukosida,
2. The pigment concentrates were more stable at pH 2,25; 4,0, and 4,25
3. The pigment concentrate of red spinach leaves were more stable than pigment powder

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## Referency

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