

Co-pigmentation Anthocyanins of Rose Pigment (varieties of Batu Local) with Catekin from Black Tea and Green Tea Extracts

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Abstract

Anthocyanin pigment has such problems such as its sensitivity to certain conditions. Co-pigmentation can be conducted by adding substances like other pigment as catechin from a kind of tea (black and green). Methodology used in this study is randomly grouped design (RAK) method with 3 times repetition. Result of this study shows the best treatment was green tea (maceration 15 minutes) and this co-pigmentation with anthocyanin pigment extract (proportion of 1:2), contained value of soluble solid 18,88 °Brix, L (lightness) 34,81, a+ (redness) 9,20, pH 2,39, 2,61 Å (521 nm), total sugar 10,07 % and antioxidant activity 83,11 %.

Keywords: anthocyanin pigment, co-pigmentation, tea catecin

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1. Introduction

Anthocyanin pigment has such problems such as it is sensitive to pH (alkaline pH, > 7), temperature, sugar, oxygen, UV light and other conditions [1] that there should be treatment to make it more stable in many conditions. Co-pigmentation can be conducted by adding anion substances, kation or other substances like other pigment [2]. On preliminary study, the use of catecin can be alternative. In this study, co-pigmentation used is the best catechin from a kind of tea (black and green).

2. Methodology

This research was conducted at the Laboratory of Food Science and Technology, the Laboratory of Biotechnology and Chemistry Laboratory of the University of Muhammadiyah Malang and Chemical Laboratory of Malang State Islamic University (UIN).

This study consisted of two phases, phase -1 to determine the effect of extraction time and different types of tea used. In (the) phase 2 after have known the best catechin of both types of tea, then copigmentation with increasing concentration of catechins on the anthocyanin pigment of red roses (local of Batu, east Java) [3,4,5].

The research method in the first stage using a randomized block design (RAK) arranged as factorial, composed of two factors, the first type of tea used (black tea (A1) and green tea (A2) and the second factor was extraction duration of catechins [7] (maceration for 5 minutes (B1), 10 minutes (B2) and 15 minutes (B3). The research method used was a randomized block design with 3 times repetition.

The second of research phase is to do co-pigmentation between the best catechins with anthocyanins roses [6] on various proportions as shown below :

K0 : Control (without catechins)

K1 : The proportion of Anthocyanins catechins = 1 : 1 (v / v)

K2 : The proportion of Anthocyanins catechins = 2 : 1 (v / v)

K3 : The proportion of Anthocyanins catechins = 3 : 1 (v / v)

There are four (4) treatments that be repeated as many as three (3) times and then analyzed with a parameter of observation include total soluble solid, color intensity, pH, absorbance, the activity/antioxidant power, sugar total, the levels of catechins and anthocyanins levels.

3. Results and discussion

The difference on kind of tea and maceration duration of catecin extract do not cause interaction, yet separately the difference on kind of tea total value of solution solid (TPT), color intensity includes L value (lightness) and a+ (redness). Result of this study shows that the best treatment on stage I is A2B3 (green tea with maceration duration of 15 minutes with total solution solid (TPT) 77,1 °Brix, L value (lightness) 87,03, a+ value (redness) 1,16, b+ value (yellowness) 0,24, pH 4,64, and absorbance (240-400 nm) by value of 3,55 and antioxidant activity of 90,21 %.

Table 1. Results of Analysis of Black Tea and Green Tea as Raw Materials

Raw Material	Water Content (%)	Mineral levels (%)	Fe levels (mg / 100ml)	pH
Black tea	9,31 ± 0,05	5,59 ± 0,04	34,72 ± 0,08	5,36 ± 0,03
Green Tea	6,60 ± 0,46	5,36 ± 0,02	28,13 ± 0,16	5,82 ± 0,02

4. Conclusion

The result of this study shows that the best treatment on the first step is A2B3 (green tea with maceration duration of 15 minutes with total solution solid 77,1 °Brix, L value (lightness) 87,03, a+ value (redness) 1,16, b+ value (yellowness) 0,24, pH 4,64, and absorbance (240-400 nm) by value of 3,55 and antioxidant activity of 90,21 %.

The result of co-pigmentation between anthocyanin pigment extract and catechin extract of green tea has real influence in total solution solid, color intensity includes L,a+ and b+ values, pH, absorbance, antioxidant activity and total sugar content. The best treatment on stage II is K3 (the result of co-pigmentation between anthocyanin pigment extract and catechin green tea extract), by total value of solution solid 18,88 °Brix, L (lightness) 34,81, a+ (redness) 9,20, b+ (yellowness) 0,83, pH 2,39, absorbance (521 nm) by value of 2,61, total sugar of 10,07 %, capacity of antioxidant activity 83,11 %.

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