Co-pigmentation Anthocyaninsof Rose Pigment (varieties of Batu Local) with 
Catechin from Black Tea and Green Tea Extracts*
Elfi Anis Saati*a, Sita Ayu Pangestia*b, Sri Winarsih and Moch. Wachidaa

*Paper presented at the 3rd Natural Pigments Conference for South-East Asia (NP-SEA) 2016 on August 22nd at Universitas Ma Chung, Malang, Indonesia a Food Science and Technology Department, Faculty Of Agricultural Animal Husbandry, University of Muhammadiyah Malang East Java, Indonesia b Student Of Food Science and Technology Department, Faculty Of Agricultural Animal Husbandry, University of Muhammadiyah Malang East Java, Indonesia

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 A (521 nm), total sugar 10.07 % and antioxidant activity 83.11 %.

Keywords: anthocyanin pigment, co-pigmentation, tea catechin *Corresponding author: E-mail Address: elfium@ymail.com

INTRODUCTION

- Anthocyanin pigment has such problems such as it is sensitive to pH (alkaline pH > 7), temperature, sugar, oxygen, UV light and other conditions
- To need a treatment to make it more stable in many conditions.
- Co-pigmentation can be conducted by adding anion substances, cation or other substances like other pigment
- This study using catechin pigment's can be alternative.

RESULT 1

The difference in kind of tea and maceration duration of catechin extract do not cause interaction, yet separately the difference in kind of tea total value of solution solid, 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 as much as 77.1 °Brix, L value (lightness) 87.03, a+ value (redness) 11.18, b+ value (yellowness) 0.24, pH 4.64, and absorbance (240-400 nm) by value of 3.85 and antioxidant activity of 90.21 %.  

DISCUSSION 1

Figure 1 indicates in black tea catechin extract treatment with long maceration 5 minutes has the highest mean absorbance value of 3.76, while extracts of black tea catechins with a long maceration of 10 minutes has the lowest average absorbance value is 3.28.

RESULT 2

This study consisted of two phases, phase 1 to determine the effect of extraction time and different types of tea used. In (2) the phase 2 after have known the best catechin of both types of tea, then co-pigmentation with increasing concentration of catechins on the anthocyanin pigment extract of red roses (local of Batu, East Java). The result of methodology was the result using a randomized block design 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.

Table 2. The mean value of L (brightness), Sugar Levels Total and extract the antioxidant power copigmentation results between Anthocyanin pigments with Green Tea Catechins Extract

<table>
<thead>
<tr>
<th>Treatment</th>
<th>L Value (Brightness)</th>
<th>Sugar Levels (%)</th>
<th>Antioxidant Power (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 (Control without Catechins)</td>
<td>39.44</td>
<td>13.42</td>
<td>67.28</td>
</tr>
<tr>
<td>X2 (Complete Catechins catechins (1:1)</td>
<td>34.08</td>
<td>13.72</td>
<td>68.31</td>
</tr>
<tr>
<td>X3 (Complete Catechins catechins (1:1)</td>
<td>34.15</td>
<td>11.51</td>
<td>78.50</td>
</tr>
</tbody>
</table>

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) 11.18, b+ value (yellowness) 0.24, pH 4.64, and absorbance (240-400 nm) by value of 3.85 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 La+ 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 %.

REFERENCES


Acknowledgement

The researchers thank to Directorate of Research and Community Service of Higher Education, Department of National Education, Republic of Indonesia who granted for our research (2018-2017) and granted patent registration to Rosana Food Products Company of Indonesia (Rosa Spa) and this Manufacturing Process.