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The People Acceptance of The Red Rose (Rosa hybrida L.) Flowers Extract as Lipsticks Dye

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Abstract. This study aimed to determine the people acceptance to various red rose extract in 5%,7%, and 9% composition on lipsticks. The panellists were women aged between 20-25 years old as college student and employees. The total of the panellists were 30 people who lived in Tangerang and Jakarta. The extract was made using the maceration method with a water solvent. Hedonic test with observation sheet was used to score the people acceptance. There were two aspects in this study, the flavour, and the colour. Friedman test and Tukey test were used to analyze the data result. The result showed that panellists most preferred the 7% additional extract for two aspects. The conclusion was the addition 7% of Rosa hybrida flowers extract as lipsticks dye is the most accepted by the people either in colour and flavour

Keywords: The people acceptance, the *Rosa hybrida* L. flowers extract, lipsticks, Friedman test, Tukey test

INTRODUCTION

Lipstick is a cosmetic product for the woman that is used to augment the beauty of lips. The adverse effects of continuously using lipsticks like skin irritation, skin discoloration, and cancer can be reduced by using natural colorant (Varghese, A,K. et.al., 2017). Water extract from red rose is more effective than the ethanol extract, or the red rose water-ethanol (1:1) to kill Escherichia coli (the MBC was 1.39 x 108 CFU/g) and Salmonella thypi (the MBC was 9.53 x 107 CFU/g) at 12.50% concentration (Saati, E.A., et.al., 2018). The total antioxidant activity of the red rose water extract was 60.00% at concentration 200 µg/mL (Khurshid. H., et. al., 2018). The antioxidant capacity of all the varieties of Rosa hybrida L. is correlated positively with their total anthocyanin content (Kumari, P., et al., 2017). This research aims to know which three different concentration of the Rosa hybrida L. flowers extract as lipsticks dye, influence people acceptance the most from the color and the flavor aspects. The reason for this study can be useful for further research on natural lipstick.

METHODS

The extract was obtained by maceration and shaking for 2 hours, filtered and centrifuged at 8000 rpm, at 4oC for 10 minutes (Oancea. S., et.al., 2012). The formulation of lipstick consists of wax (19), pigment (0-9), emollients (75), vaseline (6) (Kruthika. S.,V, et.al., 2014; Ram, S.K.V, et.al., 2014). Determination of anthocyanins in the Rosa hybrida L. extract (Şakar. D., et.al., 2008). Absorption and the first-order derivative spectra of sample solutions were recorded against the extraction solution. The spectra resulted in the absorbance values at λ = 520 nm and peak to peak amplitudes of 490.5-550.2 nm. The concentration of anthocyanins in the sample solutions was obtained through calibration graphs (Şakar. D., et.al., 2008). The people acceptance was scored using the hedonic scale (Lim, J., 2011). A five-point hedonic scale to assess the overall liking, degree of liking of the color and flavor of the lipsticks was used on the scoring by panelists (n=30) (Granato. D., et.al., 2012).

Statistical analysis

The hedonic assessment then followed by the parametric Tukey's Honest Significant Difference test (Granato. D., et.al., 2012). A p-value below 0.05 was considered statistically significant (Granato. D., et. al., 2012). The acceptance index of each lipstick sample was calculated by the percentage of respondents who indicated that they 'strongly no liked' (the score is 1), 'no liked' (the score is 2), 'moderately liked' (the score is 3), 'liked' (the score is 4) or 'strongly liked' (the score

is 5) the product (Granato. D., et.al., 2012). Data then analyzed by the non-parametric Friedman analysis of variance to verify the existence of significant differences in preference among the samples (Lim, J., 2011). The statistical method was used to find samples that differed among themselves at 5,00% of significance (Lim, J., 2011). The computational formula for the Friedman test is (Sheldon. M. R., and Fillyaw. M. J., 1996):

$$X2 = \frac{12}{Nk(k+1)} \sum R2j - 3N(k+1) \quad (1)$$

Where k is the number of ranked observations or measurements, N is the number of subjects (panelists), and Rj is the sum of the ranked scores in each subject (Sheldon. M. R., and Fillyaw. M. J., 1996). Tukey's test calculates the differences of two pairs of means to evaluate if its significant by a new critical value (Newsom., 2018). The critical associate the mean difference that has to be exceeded to achieve significance (Newsom., 2018). The critical value was calculated followed by the difference between all possible pairs of means (Newsom., 2018). Each difference is then compared to the Tukey critical value, where it showed the significance. If the difference is larger than the Tukey value, the comparison is significant (Newsom., 2018). The formula for the critical value can be seen below (Newsom., 2018):

$$T = q\frac{\sqrt{MS}}{\sqrt{n}} \quad (2)$$

Where q is the studentized range statistic (similar to the t-critical values, but different), MS is the mean square error from the overall F-test, and n is the sample size for each group.

Research Hypotheses

Research hypotheses that were tested in this study are:

1. The aspect of the color
   H0 : μA = μB = μC
   Hi: μA ≠ μB ≠ μC
   H0: There is no difference in people's acceptance of the use of the Rosa hybrida L. flowers extract with different percentages as lipsticks dye in the color aspect.
   Hi: There are differences in people's acceptance of the use of the Rosa hybrida L. flowers extract with different percentages as lipsticks dye in the color aspect.
   μA: The average value of people's acceptance of the color aspect in lipstick dye using 5% of the Rosa hybrida L. flowers extract.
   μB: The average value of people's acceptance of the color aspect in lipstick dye using 7% of the Rosa hybrida L. flowers extract.
   μC: The average value of people's acceptance of the color aspect in lipstick dye using 5% of the Rosa hybrida L. flowers extract.
2. The aspect of the flavor.
   H0 : μA = μB = μC
   Hi: μA ≠ μB ≠ μC
   H0: There is no difference in people's acceptance of the use of red rose extract with different percentages of lipsticks dye in the flavor aspect.
   Hi: There are differences in people's acceptance of the use of red rose extract with different percentages in lipsticks dye in the flavor aspect.
   μA: The average value of people's acceptance of the flavor aspect in lipstick dye using 5% of the Rosa hybrida L. flowers extract.
   μB: The average value of people's acceptance of the flavor aspect in lipstick dye using 7% of the Rosa hybrida L. flowers extract.
   μC: The average value of people's acceptance of the flavor aspect in lipstick dye using 5% of the Rosa hybrida L. flowers extract.

RESULTS AND DISCUSSIONS

In this section, researchers divide results and discussions into two, 2D and 3D CADD Training Models Using Inventor 2020 and Implementation of Project Based Learning Training Models in 2D and 3D CADD Training. Next, the following is the explanation.

The result of anthocyanin content determination of the *Rosa hybrida* L. flowers extract was 2.75 µg in 1 gram extract. The results of the lipsticks with different composition of *Rosa hybrida* L. flowers extract are shown in Figure 1, (a) the basic formula of lipstick without the extract, (b) lipstick of 1 with 5.00% of the extract, (c) lipstick of 2 with 7.00% of the extract, and (d) lipstick of 3 with 9.00% of the extract.

(a) (b) (c) (d)

Figure 1. (a) the basic formula of lipstick, (b) lipstick of 1 with 5.00% of the extract, (c) lipstick of 2 with 7.00% of the extract, and (d) lipstick of 3 with 9.00% of the extract.

The results of the people acceptance of the color of the lipsticks were shown in Table 1. And the results of the people acceptance of the flavor of the lipsticks were shown in Table 2.

Table 1. The people acceptance of the color of the lipsticks

Hedonic Scale	The percentage of score (%)		
	Adding 5.00% of the extract	Adding 7.00% of the extract	Adding 9.00% of the extract
- Strongly liked	20	33	7
- Liked	57	47	43
- Moderately liked	23	20	43
- No liked	0	0	7
- Strongly no liked	0	0	0

Table 2. The people acceptance of the flavor of the lipsticks

Hedonic Scale	The percentage of score (%)		
	Adding 5.00% of the extract	Adding 7.00% of the extract	Adding 9.00% of the extract
- Strongly liked	7	10	10
- Liked	10	67	47
- Moderately liked	80	20	30
- No liked	3	3	13
- Strongly no liked	0	0	0

Hypothesis Testing

Color aspect

Based on the results of calculations to 30 panelists obtained $X^2_{count} = 6.35$ (at the significance level $\alpha = 0.05$) while the value of X^2_{table} at the degree of freedom = 3-1=2 was 5.99. So $X^2_{count} > X^2_{table}$. H_o is rejected, and H_i is accepted, that there are differences in the assessment of the lipsticks dye by a difference in adding percentage red rose extract: 5.00, 7.00, and 9.00% get different results on people's acceptance of the color aspect.

Testing continues with the test. The double comparison is Tukey's test to determine more formulations preferably of the three treatments. Tukey's test is carried out with a standard significance

α = 0.05, v = 3 degrees of freedom, obtained Q_{table} = 3.49. T_{table} = Q_{table} x Se = 3.49 x 0.13 = 0.45. Summary of the results of the calculation of the double comparison test against the color aspect of lipsticks dye with the use of red rose extract as follows (Table 3):

Table 3 Tukey's Double Comparative Test Against the Color Aspect of Lipsticks Dye with The Use of *Rosa hybrida* Flowers Extract

Variance of treatment	Comparison of result	Conclusion
| A - B| = |3.97 - 4.13 | = 0.16	0.16 > 0.045	Significantly different
| A - C | = | 3.97 - 3,50 | = 0.47	0.47 > 0.045	Significantly different
| B - C | = | 4.13 - 3.50 | = 0.63	0.63> 0.045	Significantly different

Note: A: lipsticks with 5.00% of *Rosa hybrida* flowers extract, B: lipsticks with 7.00% of *Rosa hybrida* flowers extract, C: lipsticks with 9.00% *Rosa hybrida* flowers extract.
The results showed that the color of lipsticks with the addition 7.00% of *Rosa hybrida* flowers extract is preferred than addition 5.00% and 9.00%, and addition 5.00% is preferred than 9.00%.

Flavor aspect

Based on the results of calculations to 30 panelists obtained X^2_{count} = 13.27 (at the significance level α = 0.05) while the value of X^2_{table} at the degree of freedom = 3-1=2 was 5.99. So $X^2_{count} > X^2_{table}$. H_o is rejected and H_i is accepted, that there are differences in the assessment of lipsticks dye by a difference in adding percentage red rose extract: 5.00, 7.00, and 9.00% get different results on people's acceptance of the flavor aspect.

Testing continues with the test, the double comparison is Tukey's test to determine more formulations preferably of the three treatments. Tukey's test is carried out with a standard significance α = 0.05, v = 3 degrees of freedom, obtained Q_{table} = 3.49. T_{table} = Q_{table} x Se = 3.49 x 0.027 = 0.094. Summary of the results of the calculation of the double comparison test against the flavor of lipsticks dye with the use of red rose extract as follows (Table 4):

Table 4 Tukey's Double Comparative Test Against the Flavor Aspect of Lipsticks Dye with the use of *Rosa Hybrida* Flowers Extract

Variance of treatment	Comparison of result	Conclusion
|A - B| = |3.13 - 3.83| = 0.70	0.70 > 0.098	Significantly different
|A - C| = |3.13 – 3.47| = 0.34	0.34 > 0.098	Significantly different
|B - C | = |3.83 - 3.47| = 0.37	0.37 > 0.098	Significantly different

Note: A: lipsticks with 5.00% of *Rosa hybrida* flowers extract, B: lipsticks with 7.00% of *Rosa hybrida* flowers extract, C: lipsticks with 9.00% *Rosa hybrida* flowers extract.

The results showed that the flavor of lipsticks with the addition 7.00% of *Rosa hybrida* flowers extract is preferred than addition 5.00% and 9.00%, and addition 5.00% is preferred than 9.00%. The *Rosa hybrida* L. flowers extract contains anthocyanin, belong to the group of water-soluble pigments (Tang, Y., et. al., 2015). Anthocyanin is part of the phenolic compound class and anthocyanin are more typically found in flowers (Rafi, M., et al., 2018). The total anthocyanin contents may contribute a little to the antioxidant activities of the extracts (Rafi, M., et al., 2018).

Marketing of cosmetic products is widely influenced by color (Guerra. E., et. al., 2018). The synthetic dyes are the most widespread in the industry, and it can potentially have secondary effects on human health (Guerra, E., et. al., 2018).

Lipstick is a cosmetic applied to the lips, for protection on cold and dry air so the lips are not easily dry or even crack (Setyawaty, R., 2018). Lipstick is commonly used by women for a long time. Hence it should be safe and not irritating (Setyawaty, R., 2018). Synthetic coloring is one of the chemicals substances in the lipstick, which can accidentally consumed by the user. Those chemicals can be harmful to health if it consumed lips in long-term use (Setyawaty, R., 2018). However, synthetic substances can be replaced with natural dyes (Setyawaty. R., 2018).

This research tries to find the lipsticks dyes from the plant, especially flower. This research is expecting to find a safe the new cosmetics dyes that accepted by people.

The color and the flavor of lipsticks with the addition 7.00% of *Rosa hybrida* flowers extract is preferred than addition 5.00% and 9.00%, and addition 5.00% is preferred than 9.00%. The result showed that the addition 7.00% of *Rosa hybrida* flowers extract as lipsticks dye is the most of the people acceptance either in color and flavor.

CONCLUSION

The addition 7.00% of Rosa hybrida flowers extract as lipsticks dye is the most accepted by the people either in color and flavor. This result shows that the natural dye from Rosa hybrida flowers' extract could potentially replace chemical dye.

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