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Product testing of recycled dried coconut leaf ash and olive oil for forehead makeup of Solo Putri style bride

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Abstract. Pidih is a cosmetic used on Javanese bride's foreheads called paes. Peel material that is commonly used is wax which is colored as desired and has easy sticking properties. The aim of this research is to provide an alternative use of natural ingredients for pidih that used on the bride's forehead makeup. Experiment was conducted to obtain black powder made from recycled dried coconut leaves and olive oil with the appropriate composition and then applied as paes in the Solo Putri style bride. The use of cosmetics with natural ingredients such as the leaves of the ash of dried coconut leaves added with olive oil with a ratio of 5 grams: 4 mL can produce black, shiny, easily painted on the forehead, and rather oily. The use of cosmetics in this material can be used as an alternative for pidih that is made of wax. Alternative pidih from the ash of dried coconut leaves can be used as a substitute for conventional pidih.

1. Introduction

The bride of the Yogya Putri style is one of the five styles of Yogyakarta traditional brides who come from the Yogyakarta Palace. The distinctive feature of this bride is the presence of paes on the forehead of the bride who is filled with black pidih that seems flexible and elegant but does not use golden pradan. The form of paes consists of riders, dropper, clippers, godeg. The tip of the paes is the tip of the betel leaf and leads to the tip of the nose [1]. Paes is a distinctive make-up for traditional Javanese brides. The forehead begins with making a cengkorong (a tapered makeup on the forehead) which is then blackened with a material called pidih [2].

Cosmetics of black pidih is a semi-solid preparation and made from a mixture of oil lamp soot, candle wax, kaffir lime skin, pandanus leaves, and tamarind [3]. Wax is a mixture of hydrocarbons (linear n-alkanes and iso and cycloalkanes with long carbon branches ranging from C16 - C30 and higher) which are solid. Soot oil lamps are also the result of burning crude oil and have a particle diameter of around 30 nm [4]. It is known that paraffin and petroleum have carcinogenic potential to the skin [5].

Cosmetic body painting has been used to fill prints on the paes pattern. The use of cosmetic body painting gives a more varied range, prices are cheaper than cosmetics. Application of pidih cosmetics and body paint painting using manual techniques with welat bamboo or brushes. Now there is a new innovation using the air brush make up, which is sprayed on the forehead. The results showed that the manual use of water brush ink on the production of paes gave a neat result, cosmetics melted and came out of the boundaries of the predetermined patterns. The reason is that there is a large component of



water in brush water ink with mineral oil as the base material causing clumping in the paes [1]. Therefore, in this study we used olive oil as a carrier of black coloring material which is the ash of dried coconut leaves in the preparation of the ingredients obtained not to clot.

Research has been carried out with the use of acacia wood charcoal as a substitute for rice cake for the manufacture of this product. This study tries to utilize the dry coconut ash leaves with more availability, easier way of making it does not need to be done by the process of pyrolysis or carbonization in making charcoal, and the content of dried coconut leaves is more beneficial for the skin [6].

The purpose of this research is to get pidih cosmetic which is safer, more comfortable with making, and produce good paes results. The researcher tried to make a rice preparation made from the ash of dried coconut leaves, one material that was easily obtained and not toxic.

2. Research methodology

The material used in this study was the ash of dried coconut leaves and olive oil. The preparation was then tested using a Scanning Electron Microscope (JEOL-JSM-65-1OLA) compared with the results of a Scanning Electron Microscope of the control test [7]. The preparations are then tested to be used as ingredients on the forehead of the bride to be tested for a hedonic test. The research method uses a hedonic test using 30 panelists, assessing 3 aspects, namely beauty, color, and tidiness [8].

3. Results and discussion

Scanner Electronic Microscope (SEM) is a tool to scan the surface of an object so that it can see the topography of an object using about 20 kilos of electrons Volt, the incident angle and the average surface around 25° in three dimensions. With this tool, the curve of the object will be visible [9]. The results of the SEM testing on the test samples and the control samples showed a very irregular surface (Figure 1 and Figure 2). Figure 1 shows that the particles in the test sample preparation have a more complex surface than the control sample preparation.

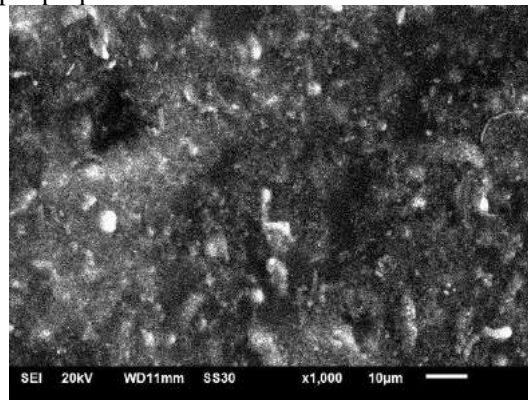


Figure 1. The SEM testing of the test samples.

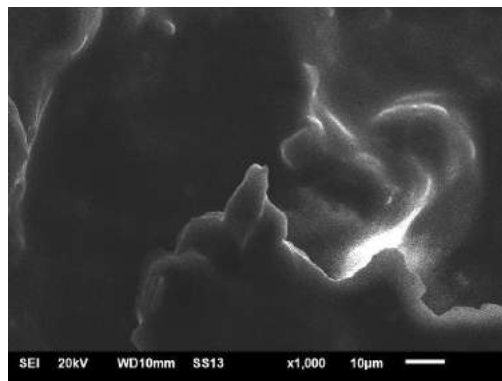


Figure 2. The testing of the control samples.

Energy dispersive spectroscopy (EDS) techniques are conventional micro-analysis techniques in scanning electron microscopy (SEM) that can determine the chemical composition of the test sample [10]. Figure 1 and figure 2 show the topography (surface and texture) of the different test samples and control samples. The morphology of the test sample (Figure 1) shows smaller particle shape and size compared to the control sample. The composition of the test sample also looks more complex than the control sample. The SEM tool is a high-resolution microscope so the test samples can be seen. Looks at the different of the morphological images between the test samples and the control samples [11].

This research uses a system tool that automatically identifies peaks, scans sample atoms (except hydrogen, helium, lithium, and beryllium). The EDS spectrum can make qualitative analysis quite quickly and accurately. The chemical composition of the samples studied was determined using the ZAF component (giving a correction of intensity due to the impact of X-ray emissions on excitation of sample material (Z), probability of absorption (A), and secondary fluorescence (F)) [10].

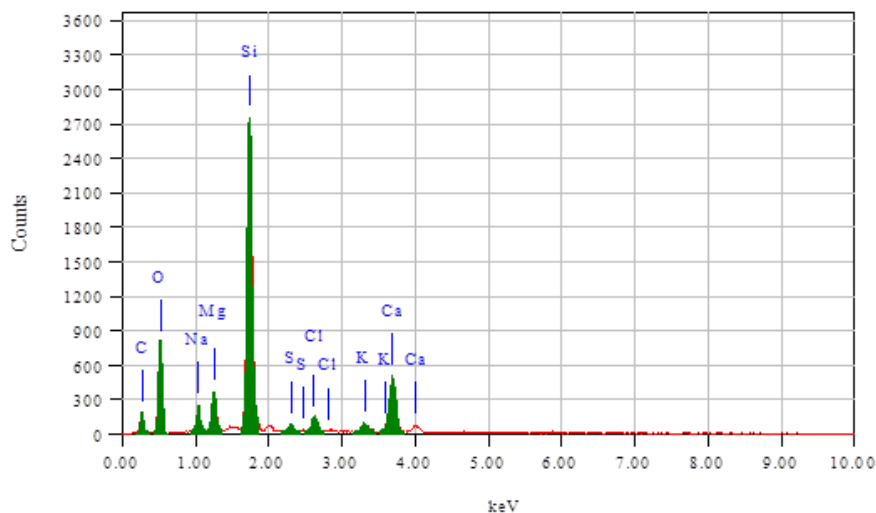


Figure 3. Energy dispersive spectrum of test samples.

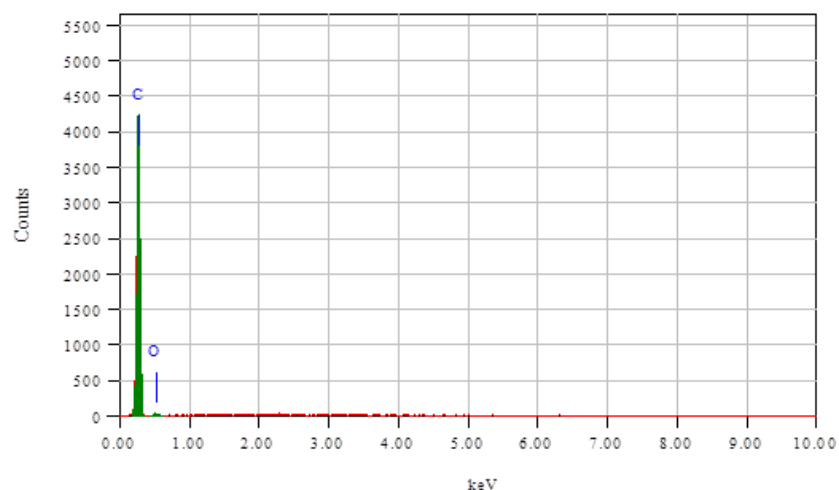


Figure 4. Energy dispersive spectrum of control samples.

Figure 3 and Figure 4 show the dispersion of the X-ray energy spectrum from the test sample and the control sample. By using the ZAF method obtained a quantitative analysis of test samples consisting of carbon atoms 84.25%, oxygen atoms 12.12%, sodium atoms 0.43%, magnesium atoms 0.44%, silicon atoms 1.98%, sulfur atoms 0.07%, chloride atoms 0.23%, potassium atoms 0.06%, and calcium atoms 0.41%. The results of the 100% control sample analysis are carbon atoms.



Figure 5. A: pidih positive-control, B: test pidih powder, C: test pidih.

Figure 5 shows the control output used, pidih powder test (dry coconut leaves ash), and test content used in this study. Pidih test is made from the ash of dried coconut leaves added with olive oil with a ratio of 5 grams: 4 mL. This comparison is obtained after conducting a preliminary test by making three comparisons the dried coconut leaves ash powder to olive oil are 5 grams to 3 mL, 5 grams to 4 mL and 5 grams to 5 mL to make sure the best comparison. Of the three comparisons, the best inherent ratio is 5 mg in 4 mL. The ratio of the dried coconut leaves ash powder to olive oil is 5 grams to 4 mL give the best quality parameter like easy to describe on the forehead, stick to the forehead well, and give the shape of the painting that is as desired. The ratio of dried coconut leaves to olive oil of 5 grams : 3 mL give preparation more difficult to describe on the forehead and difficult to make shape of the forehead makeup. The ratio of dried coconut leaves to olive oil of 5 grams : 5 mL give the preparation no stick well and difficult to make shape of the forehead makeup. The mixing was made using a mortar to be mixed homogeneously. The results of the application in the Solo Princess style bride can be seen in Figure 6.

The coconut leaves ash is used for herbal medicine commonly [12]. So, the material is safe for the skin. The olive oil is one of the oil that recommended as skin care, for neonatal until adult [13]. The mixture of the test sample contains safe ingredients and useful for the skin.



Figure 6. The results of the pidih application in the Solo Putri style bride.

The results of the hedonic test result from the use of pidih samples in the Solo Putri style bride using 30 panelists and assessed three aspects, namely beauty, color, and tidiness using the numerical scale found in Table 1.

Table 1. Numerical scale used.

Hedonic scale	Numerical Scale
Very favored	7
So favored	6
Favored	5
Quite favored	4
Neutral	3
Quite not favored	2
Not favored	1

From the results of the hedonic test using 30 panelists, was obtained data include of test samples : the beauty of 5.90 ± 0.712 , the colour of 4.47 ± 0.730 , and the tidiness of 5.07 ± 0.740 . The hedonic test

results show that the beauty, colour, and tidiness of the paes is very favored by the panelists. The results of control samples : the beauty of 5.97 ± 0.468 , the colour of 4.60 ± 0.563 , and the tidiness of 5.37 ± 0.490 .

One-way ANOVA F-test was run in order to compare the data of the test samples group with the data of the control samples group. Table 2 presents the one-way ANOVA results which are indicative that between the groups there is not a significant difference ($p < 0.05$) [14].

Table 2. The one-way ANOVA F-test results of hedonic test using 30 panelists of the pidih test sample and the pidih positive-control.

	Source of Variance	Degrees of Freedom	Sums of Square	Mean Square	F value	F _{table} (5%)
Beauty	Attractive	1	0.816666667	0.816666667	2.136842	4.006872886
	Galat	58	22.16666667	0.382183908		
	Total	59	22.98333333			
Colour	Attractive	1	0.266666667	0.266666667	0.627027027	4.006872886
	Galat	58	24.66666667	0.425287356		
	Total	59	24.93333333			
Tidiness	Attractive	1	1.35	1.35	3.42919708	4.006872886
	Galat	58	22.83333333	0.393678161		
	Total	59	24.18333333			

The table 2, showed that the F value of the beauty, the colour, and the tidiness aspects were less than the F table for $\alpha = 0.05$. It showed that the results of the beauty, the colour, and the tidiness of the pidih test samples is not significantly different with the positive-control samples.

4. Conclusion

Based on the study, the pidih made from the ash of dried coconut leaves and olive oil with a ratio of 5 grams: 4 mL can be applied as an alternative material for making paes in the Solo Princess style bride.

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Conflict of Interest

The authors declare no conflict of interest.

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