The Effect of the Composition of Alginate Flour on the Making of Batik Simbut

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Abstract. Batik simbut is batik made using cold wax. A breakthrough in the batik making process, now batik can be done using cold wax. If in general, many batik craftsmen use wax heated by the stove, then this cold wax does not need to be heated by the stove. The batik wax is a material that is used to cover the surface of the cloth according to the batik motif so that the covered surface has a resist or rejects the color applied to the cloth. In making batik simbut as a barrier used cold wax, including from alginate flour. The objectives of this study were: to determine the composition of Alginate Flour needed to make cold wax batik wax and to determine the effect of the composition of Alginate Flour on the quality of cold wax batik results. The research method used includes the test of composition and test results of manufacture. The procedure for implementing the research stages is as follows: 1). Determination of the wax composition; 2). Making cold batik wax with Alginate Flour according to the composition; 3). Batik process and coloring trials; 4). Wax release/ pelorodan process; 4). Test the results of the manufacture. The results of sample trials with the composition of 2 ounces of alginate flour, 1 g of palm sugar, 1 tablespoon of coconut oil, ½ spoon of salt, and 30 ml of water have the best quality level of batik smoothness compared to other samples. This sample also has the best quality of the sharpness of the motif compared to other samples.

Introduction

Batik is a work of art from the high-level culture of the Indonesian people that has long been developed and recognized by the Indonesian people [1]. The word batik has several meanings. According to Hamzuri [2], in his book entitled Classic Batik, the meaning of batik is a way to decorate cloth by covering certain parts using a barrier. The barrier substance that is often used is wax or paraffin. The cloth that has been drawn using wax is then colored by dyeing it, after that the wax is removed by boiling the cloth. Finally, a piece of cloth called batik is produced in the form of various motifs that have special properties.

Batik (or the word Batik) comes from the Javanese "amba" which means to write and "nitik". Batik is the art of painting done on cloth using wax or paraffin as a protection
to get decorations on the cloth. Etymologically, the word batik comes from the Javanese language, namely "tik" which means point/ matik (verb, to make a point) which later evolved into the term "batik" [3]. Also, it has a meaning related to making dots or dropping wax on the cloth.

Before the discovery of wax, it is said that in Banten, people used black sticky rice porridge as ink to make motifs on the cloth. They named it batik simbut which means blanket. During the era of the Tarumanegara Kingdom in the fifth century, there were artifacts of simbut cloth that used sticky rice porridge as a barrier. [4]

Timbul Haryono explained that in Indonesia, the area that recognized batik for the first time was Priyangan, which is referred to as the term simbut. The simbut cloth is made with mori which is spun and woven by itself, not using wax as a color barrier but using the starch (jenang) of glutinous rice. The embryo of Batik was a simpler form. The simbut cloth from Banten is one of the earliest Batik, using rice porridge as a color barrier [5]. Ma'a cloth from Toraja in Central Sulawesi also uses rice porridge. Since Toraja is isolated in the mountains, experts suspect that it is likely that Batik was originally from there, not influenced by India. This raises the theory that perhaps Indonesia also gave birth to the first Batik. In addition, there are also ancient fabrics that are more than 150 years old. Risda said that the cloth was named Simbut cloth which in Sundanese means blanket. The simbut cloth is made from mori which is the result of spun and woven by the local people, and does not use wax as a color barrier but uses starch (jenang). In addition, the cloth has simple decorations and uses more of a dark red color. [6]

One way to apply decorations to the surface of the fabric is the dye holding technique. The material to hold the dye must be easy to stick to the surface of the fabric and not penetrate the dye. In the household environment in the archipelago, the suitable material for this is porridge. On the surface of the cloth, which is spread evenly, the pulp which is still warm is smeared with crushed bamboo sticks, forming a certain decoration. After the slurry is dry, the cloth is smeared with or dipped in dye. Because the slurry does not penetrate the liquid, the part that is covered by the pulp is not transparent to the dye. When the pulp has been removed from the surface of the cloth, a decoration appears which was originally covered in pulp. This is the simplest dye holding technique in Indonesia. [7]

A breakthrough in the process of making batik, now batik can be done using cold waxes. If in general, many batik craftsmen use wax heated by the stove, then this cold wax or paraffin does not need to be heated by the stove. The batik wax is a material that is used to cover the surface of the cloth according to the batik motif so that the covered surface has a resist or rejects the color applied to the cloth. The batik wax is a mixture of synthetic or non-synthetic organic substances as an obstacle in batik [8]. Batik wax covers the surface of the cloth according to the batik motif image so that the covered surface resists the color given to the cloth [9]. The requirements for a good batik wax according to [10] are 1). has good adhesion to the fabric; 2). able to protect fabrics from dyes; 3). easy to attach and easy to remove back from the fabric; 4). easily melts when heated; 5). Soluble in organic solvents (gasoline, kerosene, thinner) at room temperature 6). leaves no color on the fabric; 7). easy to freeze; 8). not easy to crack.

The advantages of cold wax according to Pramana [11] are 1) wax does not need to be heated, can be used in cold conditions; 2). wax can be given a color; 3) no need to use cantsing, you can use plastic bottles; 4) wax is released with cold water only; 5) easy to make batik; 6) the batik process can be fast; 7) cheap and easy to get; 8) Can be made batik in all kinds of fabrics and use all kinds of paints.

The development of color barriers in Indonesia includes the dyeing technique (jumputan, sasirangan, tritik, rainbow) and batik. Meanwhile, in other countries, other techniques have been found, namely in Nigeria (adireeleko) and Japan (katazome), both of which use a flour-based paste as a color barrier on the fabric. [12]
In the manufacture of cold wax batik, the wax is used as a barrier, one of which is using alginate flour. Alginate Flour can glue ingredients so it is widely used as an adhesive in food and used as glue [13]. Alginate Flour has a white powder form. Alginate Flour is different when you feel it with your fingers because it has a coarse texture, is light, and sticks easily. Alginate Flour can be used as a raw material or a mixture of various products, besides that Alginate Flour can also be used as a thickener, compaction/filler, binder and can also material warp seizing in the textile industry. For this reason, Alginate Flour can be used as wax-making on cold wax batik because it has adhesive properties and can cover or resize batik techniques.

Table 1. Chemical Composition of Seaweed

| No | Composition        | Value  |
|----|--------------------|--------|
| 1  | Water (%)          | 13.9   |
| 2  | Protein (%)        | 2.69   |
| 3  | Fat (%)            | 0.37   |
| 4  | Crude fiber (%)    | 0.95   |
| 5  | Mineral Ca (ppm)   | 22, 39 |
| 6  | Mineral Fe (ppm)   | 0.121  |
| 7  | Mineral Cu (ppm)   | 2.763  |
| 8  | Thiamine (mg / 100g) | 0.14 |
| 9  | Riboflavin (mg / 100g) | 2.7  |
| 10 | Vitamin C (mg / 100g) | 12   |
| 11 | Carrageenan (%)    | 61.52  |
| 12 | Ash (%)            | 17.09  |
| 13 | Pb (ppm)           | 0.04   |

Source: Wheatson and Lawson, 1985

From the table above, it is known that Alginate Flour has the largest carrageenan composition, namely 61.52%. How to make a cold wax from Alginate Flour is to make porridge first by putting water in a small saucepan and adding Alginate Flour little by little and stirring evenly until it becomes thick. Then add the seeds a little butter or coconut oil or liquid paraffin and stir until blended. In order not to rot easily add benzoic preservative or salt or brown sugar and let stand 2 hours before use. To adjust the thickness, you can add water and mix well. Alginate flour cold wax can last up to 2 weeks [11].

So far, people only know the process of making batik and batik wax without knowing the effect of the batik wax composition itself on the batik results. For this reason, this research was conducted so that the public would better know the effect of the composition of the cold batik wax from alginate and more focused on the effect of alginate, which is one of the staple ingredients of cold wax for batik. The objectives of this study were: to determine the composition of Alginate Flour needed to make cold wax...
batik wax and to determine the effect of the composition of Alginate Flour on the quality of cold wax batik results.

**Method**

The research method used was experimental research methods. The experimental method is research that is used to find the effect of certain treatments on others under controlled conditions [14].

The research method used to obtain the required data is as follows: Test for making simbut batik wax with Alginate Flour which includes the composition test and the manufacturing result test. Composition of the wax sample from Alginate Flour made 5 sample recipes, namely as follows:

- **Sample A:** Alginate Flour 2 ounces, 1 g of palm sugar, 1 spoon of coconut oil, ½ spoon of salt, and 30 ml of water.
- **Sample B:** Alginate Flour 1½ ounces, Palm sugar 1 g, coconut oil 1 spoon, ½ spoon salt, and 30 ml water.
- **Sample C:** Alginate Flour 1 ounce, 1 g of palm sugar, 1 spoon of coconut oil, ½ spoon of salt, and 30 ml of water.
- **Sample D:** Alginate Flour ½ ounce, Palm sugar 1 g, Coconut oil 1 spoon, ½ spoon salt, and 30 ml water.
- **Sample E:** Alginate Flour ¼ ounce, 1 g of palm sugar, 1 spoon of coconut oil, ½ spoon of salt, and 30 ml of water.

How to Make Cold wax from Seaweed Flour:

- Make porridge first, put water in a small saucepan, add enough seaweed powder, stir until blended, add enough salt, then heat on the stove, stirring constantly, while heating until it becomes a thick pulp.
- Cool, when it's cold, stir using a mixer and add a little liquid brown sugar, add a little liquid paraffin or coconut oil then mix until blended, so it doesn't rot quickly with preservative (benzoate).
- Cold wax is ready to use if the water is thick and mix again until blended, cold wax from seaweed flour, about 5-7 days strength.

The process of making batik with cold wax on the cloth is as follows: (1) making a pattern with a pencil, (2) providing an outline with cold wax, (3) giving a color according to the design, (4) for pigment and dispersion dyes after drying iron so that the color not lost while for reactive dyes it is enough to dry, (5) after ironing the cloth is washed with cold water to remove cold wax and the remaining dyes, for reactive dyes after drying it is steamed for 20 minutes and washed in cold water (Permana, 2018).

Implementation Procedures Stages of research are as follows:

- Determination of the composition of the wax
- Making batik wax cold wax of flour seaweed (alginate) according to the composition
- Test batik and staining
- Process release wax / pelorodan
- Test batik results

**Result and Discussion**

The results achieved in the study entitled "The Effect of Seaweed Flour Composition (Alginate) on the Making of Simbut Batik" are as follows:
Smoothness Test of Alginate Flour in Simbut Batik Making

This research aims to obtain samples of Alginate Flour needed to make cold wax batik wax with the right composition. The parameter used in this study is the composition of the wax from alginate flour. To get this goal, you have to make several sample compositions with a wax content of alginate flour which is different for each sample. The samples made in this study were 5 (five) samples. The ingredients used to make cold wax consist of alginate flour, salt, brown sugar, coconut oil, and water.

After making the composition of the cold wax sample, then testing the smoothness of batik with 5 compositions that have been made. The smoothness test of batik with seaweed powder wax (alginate) was carried out with the thickness of the sample results of the simbut batik. Testing the fluency of batik is carried out using a questionnaire method with qualitative and quantitative assessments. Qualitative assessment is carried out by giving opinions or responses from the sample visually by observing. Meanwhile, a quantitative assessment is carried out by counting the number of respondents who chose and gave good scores to the sample.

The number of respondents in this test was as many as 20 people. Each respondent was asked to give a value to each sample by looking at the smoothness of batik with 5 samples of cold wax. The results of the questionnaire assessment can be seen in the following table:

| No. | Sample | Very fluent | Smoothly | smooth | Not fluent | Very not smooth |
|-----|--------|-------------|----------|--------|------------|----------------|
| 1.  | Sample A | 19          | 1        | 0      | 0          | 0              |
| 2.  | Sample B | 5           | 10       | 5      | 0          | 0              |
| 3.  | Sample C | 0           | 9        | 8      | 3          | 0              |
| 4.  | Sample D | 0           | 2        | 12     | 6          | 0              |
| 5.  | Sample E | 0           | 6        | 9      | 5          | 0              |
Based on the results of Figure 1, it can be explained as follows:

a. In sample A, almost all respondents gave a value of 1, which is very smooth, so it can be concluded that sample A is the sample that has the best level of batik fluency.

b. In sample B, of the 20 respondents who gave very fluent scores as many as 5 people, 10 people had a current score and 5 people scored quite smooth. So, it can be concluded if sample B has a good level of batik fluency.

c. In sample C, of the 20 respondents who gave current scores as many as 9 people, 8 were quite current and 3 were not good. So, it can be concluded if sample C has a good level of batik fluency.

d. In sample D, of the 20 respondents who gave current scores as many as 2 people, 12 were quite current and 6 were not good. So, it can be concluded if sample D has a good level of batik fluency.

e. In sample E, of the 20 respondents who gave current scores as many as 6 people, 9 were quite current and 5 were not good. So, it can be concluded that sample E has a smooth level of batik making.

Based on this explanation, it is concluded that sample A with a composition of Alginate Flour 2 ounces, 1 g of Palm sugar, 1 tablespoon of coconut oil, ½ spoon of salt, and 30 ml of water has the best quality level of batik smoothness compared to other samples. This can be seen from the results of the questionnaire that has been conducted. Almost all respondents gave very fluent scores for sample 1.

**Simbut Batik Motif Sharpness Test**

The second objective of this study was to determine the effect of the composition of Alginate Flour on the quality of the batik simbut. The quality of the batik simbut can be seen from the sharpness of the batik motif.

Testing the sharpness of this batik motif is done using a questionnaire method with qualitative and quantitative assessments. Qualitative assessment is carried out by giving opinions or responses from the sample visually by observing. Meanwhile, a quantitative assessment is done by counting the number of respondents who choose and give good scores to the sample.
The number of respondents in this test was as many as 20 people. Each respondent was asked to give a value to each sample by looking at the sharpness of the sample motif. The results of the questionnaire assessment can be seen in the following table:

| No. | Sample  | Level of sharpness of motifs |
|-----|---------|------------------------------|
|     |         | Very sharp | Sharp | Sufficiently sharp | Not sharp | Very not sharp |
| 1.  | Sample A | 13         | 7     | 0                  | 0         | 0               |
| 2.  | Sample B | 8          | 9     | 3                  | 0         | 0               |
| 3.  | Sample C | 4          | 8     | 8                  | 2         | 0               |
| 4.  | Sample D | 0          | 2     | 17                 | 1         | 0               |
| 5.  | Sample E | 1          | 10    | 9                  | 0         | 0               |

Based on the results of Figure 2, it can be explained as follows:

a. In sample A, almost all respondents gave a value of 1, which is very good, so it can be concluded that sample A is the sample that has the best level of motive acuity.

b. In sample B, of the 20 respondents who gave very good scores were 8 people, 9 people had good scores and 3 people scored quite good. So, it can be concluded that sample B has a good level of motive acuity.

c. In sample C, of the 20 respondents who gave very good scores were 4 people, good scores were 8 people, good enough scores were 8 people, and bad scores were 2 people. So, it can be concluded that sample C has a good level of motive sharpness.
d. In sample D, of the 20 respondents who gave good scores as many as 2 people, 17 people had good enough scores and 1 person had bad scores. So, it can be concluded that sample D has a fairly good level of motive sharpness.

e. In sample E, of the 20 respondents who gave very good scores were 1 person, 10 were good scores and 9 were quite good. So, it can be concluded that sample E has a good level of motive sharpness.

Based on this explanation, it is concluded that sample A with a composition of Alginate Flour 2 ounces, 1 g of Palm sugar, 1 tablespoon of coconut oil, ½ spoon of salt, and 30 ml of water has the best quality of the sharpness of the motives compared to other samples. This can be seen from the results of the questionnaire that has been conducted. Almost all respondents gave very good scores for sample 1.

Conclusion
From the research and study of the effect of the composition of Alginate Flour on making batik simbut, it can be concluded that the more the composition of the alginate flour, the thicker the wax will be and the wax will not break easily. Wax sample A with a composition of Alginate Flour 2 ounces, 1 g of Palm sugar, 1 tablespoon of coconut oil, ½ spoon of salt, and 30 ml of water is the best sample of the wax among the other samples. Sample A with a composition of Alginate Flour 2 ounces, 1 g of Palm sugar, 1 tablespoon of coconut oil, ½ spoon of salt, and 30 ml of water is the best sample seen from the level of smoothness of the batik and the sharpness of the simbut motif.

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