



# NATURAL COLORS OF JOLAWE FRUIT, BARK OF TINGI, JAMBAL, AND TEGERAN AS BATIK COLORING (DYEING)

Sarwono<sup>1</sup>, Darwoto<sup>2</sup>, and S Mataram<sup>3</sup>

<sup>1, 2</sup> Textile Art Departement, Faculty of Visual Art and Design, Universitas Sebelas Maret, Indonesia  
<sup>3</sup> Visual Communication Design Departement, Faculty of Visual Art and Design, Universitas Sebelas Maret, Indonesia  
E-mail: <sup>1</sup> sarwono@staff.uns.ac.id, <sup>2</sup> dwt\_27@staff.uns.ac.id, <sup>3</sup> sayidmataram@staff.uns.ac.id

## INTRODUCTION

The usage of jolawe fruit and barks of tingi, jambal, and tegeran in the daily life is often use to color food. However, jolawe fruit, and barks of tingi, jambal and tegeran can also be using to color the cloth. The natural color of jolawe fruit, and barks of tingi, jambal and tegeran is rarely use in the textile product dyeing, even though the color result is interesting to be delved and developed, because it has more potential than another color substance.

## THEORITICAL STUDY

### I. Natural Dyeing

The natural color exists in the plant parts, such as leaf, stem, bark, flower, fruit, root, seed, and so on, with different rate and kind (type) coloring matter. Based on the coloring type, it is gaine the natural color wealth in Indonesia. The natural color, principally, can be used to color all textile fibers, whether it comes from natural fiber or semi-synthetics, either the one included to the cellulose fiber type or protein. There are four basic aspects needed to be considered in the process of natural color dipping, e. g. mordanting process, extraction process with water solvent, the cloth dipping into the solvent and dipping improvement on the fiber called fixation, and washing.

### 2. The Mordanting Dyeing Process

The mordanting process is a process of putting the metal element (alum, lotus tree or others) into the cloth fiber so that it will give reaction to the type of the other natural colors. This process determines very much on the dyeing achievement with the natural color substance. The mordanting goal is to increase the cloth absorption to the natural color substance.

### 3. The Process of Natural Color Taking from Its Resource

The natural color taking is usually by boiling / extracting and fermentation. The natural color taken by fermentation is indigo color. The natural color of plants, trees or roots are generally gained by extracting (either in high or low heat) parts of the plants which are the resource of the colors (flower, leaf, bark, root, grass, weeds, grapes, and mushroom), by using water solvent.

### 4. The Natural Color Dipping (Immersing)

Immersing is a process of color dyeing evenly on textile material. The immersing process is principally a process of combining between the fiber and color substance. The combination happens because of the chemical reaction between the fiber and color substance. The simplest description of the natural color immersing is putting the textile material (thread or cloth) into the solution of the natural color substance, after the color substance absorbs in the textile material, the material is taken, dried, fixed, then washed, and after washing, it will be gotten the colored cloth which suitable to the color needed.

### 5. Fixing

In coloring, it is needed the existing of color generation and at the same time as the color tying in order not to be faded. The cloth has been immerse in the natural color cannot be washed directly, because the existing color is still needed to generate in order not to be faded and it sometimes needs an oxidation process.

The color fixation using metal salt, besides for strengthening the ties, it also functions to change the color direction of the natural color substance. This salt is safe and environmentally friendly, among others alum [KAl(SO<sub>4</sub>)<sub>2</sub>], limestone [Ca(OH)<sub>2</sub>], lotus tree (FeSO<sub>4</sub>). The dose recommended is 7% for alum, 5% for limestone, and 1%-2% for lotus tree.

### 6. Washing

Washing is did after the fixation process, with the goal removing the color substance stuck on the fiber surface, and smoothing the fiber absorption is not perfect.

### 7. Jolawe Fruit, and Barks of Tingi, Jambal and Tegeran

Each region has known jolawe, tingi, jambal and tegeran (onion). The following are several region names for onion, among others are pia (Batak), bawang sirih or dasun merah (Minangkabau), bawang suluh (Lampung), bawang beureum (Jawa Barat), brambang or bawang abang (Jawa Tengah and Jawa Timur) and so on.



Figure 1 Jambal, Jolawe fruit's, Tegeran, Tingi Bark

## THE RESEARCH METHOD

The research method is a single case study with action research with holistic that it is still seen that many factors which are considered to be related and interacted each other, only factor, that is not the mainly one, does not become the focus and is not discussed. The data resource used in this research is in the forms of: Work of experimental result as the direct observation, the data resource of the experimental result of the doer, events, archives, and documents.

These varied data resources demand a certain way that is suitable to gain the data, therefore the strategy of the data collecting in this qualitative study is grouped into two ways, that is interactive and non-interactive. The observation can be done directly or it is often called a participative observation, e. g. the researcher plays in many kinds of roles in many possibilities in various situations or even directs the events being studied with the goal that he can interact with the informant. This qualitative research uses a sampling technique with purposive sampling characteristic, and the data validity uses triangulation data. The analysis process is does by flowing, using the Staining Scale and Grey Scale.

## DISCUSSION

The phases of the process of the uses of jolawe fruit, and barks of tingi, jambal and tegeran for textile color substance. The color stuff which is used as the natural color stuff of jolawe fruit, and barks of tingi, jambal and tegeran, supporting stuffs for fixation are alum, limestone and lotus tree as follows:

### 1. Early Process

The preparation phase in the natural coloring process is mordanting, coloring process / extracting, fixation process. Each phase is relate to each other and is very important for the next process, it is:

The mordanting process is a process of putting in metal element (alum, lotus tree or others) into the cloth fiber so that it will react to the other type of the natural color. The goal of mordanting is to increase the cloth absorption to the natural color substance. The equipment in mordanting process are scales, aluminum pan, stirrer, stove, pail, string for drying the cloth, thermometer, pH paper / lakmus paper (paper used for testing the acidic and alkalinity of the water). The extraction process is a process of taking the natural color substance. The supporting equipment used in this process is: aluminum pan, stove, watch / stop watch, measuring cylinder, stirrer and filter. The fixation process is a process of improvement in immersing the natural color substance. In order to gain a color that will not fade, it uses alum, limestone, and lotus tree.

### 2. Implementation Process

#### a. Mordanting Process

Mordan Standardization Process for silk cloth has the formulae: "500 gr cloth needs 100 gr alum, and water 171l".

#### b. Extraction Phase

The method of making the natural color of the skin of jolawe, tingi, jambal and tegeran: 500 grams of skin of jolawe, tingi, jambal and tegeran, boiled in 5 liters of water for one hour. Separate the skin waste of jolawe, tingi, jambal and tegeran by filtering to gain the solution. Cloth that has been process is tied and immersed in the solution / boiling of the color substance for around 15 minutes. Drain well and it can be immerse again in order to get the dark color needed. Having finished immersing, it is does a companying process, it is fixation.

### 3. Fixation Phase

Method of making fixation solution: Weigh the metal salt alum 70 grams/liter, limestone 50 grams/liter, lotus tree 20 grams/liter, solute in the water (alum can be heated in order to solute fast). The dry cloth is put into the metal salt / fixation needed for more or less than 5 minutes. Then, drain well, the cloth is washed with clean water. The washing phase with clean water, and dry in the shady place.

### 4. Mordanting Process with Cold Water

Solute 100 gr of alum in 2 liters fresh water, heat it until boiling. After it has boiled, lift up from the stove, add 3 mlTRO and 8 liters fresh water. Immerse 250 grams of batik cloth for 15 minutes, and drain well for extracting immersing. Immerse 1000 grams of dry skin of onion with 10 liters of fresh water, heat it until boiling or it is only a half left. Cool and separate the coloring stuff and extraction solution by being filter. The solution is ready to be use.

### 5. Immersing

Put the cloth into the extraction solution by being invert until it is equal and immerse for 15 minutes, then, dry it in the shadow place by spreading over the string until dry or half dry, repeat the immersing and drying until it is gain the color needed.

### 6. Fixation

Process: Prepare alum: 70 grams and solute in 500 ml hot water and add 500 ml cold water. The solution is kept in for 24 hours, and take the clean solution. Prepare limestone: 50 gr and solute in 500 ml hot water and add 500 ml cold water. The solution is kept in for 24 hours, and take the clean solution. Prepare lotus tree 20 gr, solute in 500 ml hot water and add 500 ml cold water. The solution is kept in for 24 hours, and take the clean solution. The solution can be use directly to dye the cloth by using the natural color. The next process; put the cloth into the solution of alum, limestone or lotus tree for more or less than 3 minutes. Take the cloth off the solution, flush clean with the fresh water, and drain well.

The following process: boil 10 liters water until boiling, then add 100 grams of tapioca starch by stirring it in order to be equal on the cloth. The batik cloth that will be clean is stir until the wax has been free. The next process, after the wax that has been freed, take the cloth and put into the cold water to be flushed, drain well and dry in the shady place.



## CONCLUSION

The Natural Coloring of jolawe fruit, and barks of tingi, jambal and tegeran for cotton cloth:

### 1. The result evaluation on the silk cloth by using the natural color of jolawe, tingi, jambal and tegeran with alum fixation:

The evaluation of the color change on the silk cloth that uses the natural color from the skin of jolawe, tingi, jambal and tegeran with the alum fixation is very good base on the fading test. The score of the color change on the cotton cloth that uses the natural color from the skin of jolawe, tingi, jambal and tegeran with alum fixation is 3-4 (good).

### 2. The evaluation on the silk cloth uses the natural color substance of the skin of jolawe, tingi, jambal and tegeran with limestone fixation:

The evaluation of the color change on the silk cloth which uses the natural color of jolawe fruit's, and barks of tingi, jambal and tegeran with limestone fixation is very good in the fading test. The change score of the color value on the silk cloth which uses the natural color of jolawe fruit's, and barks of tingi, jambal and tegeran with limestone fixation is in category 2 (fair).

### 3. The evaluation on the silk cloth that uses the natural color of jolawe fruit, and barks of tingi, jambal and tegeran with lotus tree fixation:

The evaluation of the color change on the silk cloth that uses the natural color of the skins of jolawe, tingi, jambal and tegeran with lotus tree fixation is very good in the fading test. The change of the color score on the silk cloth which uses the natural color of jolawe fruit's, and barks of tingi, jambal and tegeran with lotus tree fixation is 3-4 (good).

