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Natural dye extracts from suji leaves (*Dracaena angustifolia*) for textile coloring

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ABSTRACT

Dracaena leaf (*Dracaena angustifolia*) is a natural dye that is often used in Indonesia as a food coloring. Dracaena leaves have a green pigment. This study aimed to extract color in dyeing fabric utilization. In this study the worn fabric is cotton and silk. Water solvent extraction by comparison distilled water and dracaena leaves 1:4. pigment produced is used as a fabric dye. By the time variation of fabric dyeing 5, 10 and 15 minutes. Having dyed, fabric variations fixation with fixer solution $FeSO_4$, $Al_2(SO_4)_3$ and $CaCO_3$. During this research produced the best dyeing cotton and silk are on soaking time 15 minutes with fixer solution $FeSO_4$ by resulting of spectrophotometer.

Key words: *dracaena, extract color, dye, fixer solution.*

INTRODUCTION

Natural dye is has been a role with a long human life since ancient times. Humans learn how the way to use dye from natural for their life activity such as body paint, wall paint , and as a component in rituals according to the beliefs of each local. The natural dyes come from all parts of the plant whether it is wood, roots, bark, stems, leaves, flowers and seeds. Dyeing fabrics or fibers with natural dyes, most are in the process of dye staining material in the mince and boiled for extractions components in color from plants.then dye the fiber using heat and chemicals to dye, which helps color fix to the fibers better. The natural dyes advantages are that it does not cause any pollution. Current production and natural colors are used in small quantities. It is popular much due to the process of natural dye treatment is complicated it need long time ,color is not bright enough ,not resistant of washing and sunlight. Chlorophyll pigments abundant in leaves, for example suji leaves, pandan leaves, cinnamon leaves, and so on. The foliage is green producer for various types of pastry snacks. Besides producing a beautiful green color, also has a distinctive aroma. The cinnamon leaf (Sauropus androgynus Merr.) Is used as a natural dye that can give the green color without causing residue. Plant leaves a single leaf, because only a blade and petiole course, readily available and already used a variety of food such as sticky rice and green dye on others. Utilization with extracted or ground by adding water, and then the filtrate was used for the green food coloring [1]. Sasikarn was stadied the extracted dye from the turmeric was used as a yellow natural dye for dyeing of cotton yarn[2]. The results showed that the dyeing of cotton yarn using the pre-mordanting with alum provided better percentage of exhaustion than with other mordants (ferrous sulfate, copper sulfate) or without a mordant. The cotton yarn treated with pre-mordanted by alum was moderate of the wash fastness property. The dyeing silk with natural dye from leaves and stem bark of *Dipterocapus alatus* Roxb. Color shade of silk without nano zinc oxide coated and silk with nano zinc oxide coated dyeing with leaves and stem bark of *Dipterocapus alatus* Roxb were investigated. The result reflected that the maximum adsorption of dye from

leaves and stem bark of *Dipterocapus alatus* Roxb. Silk with nano zinc oxide coated more rugged than silk without nano zinc oxide coated. The light fastness and washing fastness average of silk with nano zinc oxide coated and silk without nano zinc oxide coated was 4-5.[2]

Therefore, researchers are interested in the study of natural dyes extracts from *Dracaena angustifolia (suji leaves)*. *Dracaena* is a plant that is easy to find. The *Dracaena* extract in a water stain. Then the dye onto the cotton and silk cloths to investigate the optimum condition in staining agents such as the fixer solution $FeSO_4$, $Al_2(SO_4)_3$ and $CaCO_3$.

RESEARCH METHOD

Dye Extraction

Cut into small size sample plant parts such as leaves, stems, bark or fruit. The material is dried and then roasted for 30 minutes. Then weighed and calculated weight. Take the pieces of 500 g. Put the pieces of leaves into a pot add water with a ratio of 10:1.Then heated until the volume of water to be third. If the color pigments of plants have shown the water boiling out into color. If the solution remains clear means the plant can be ascertained not contain color pigments.Extraction solution was filtered to separate the pulp strainer with the extracted material.

Preparation Dyeing With Natural Dyes

Mordanting
Pieces of textile materials as sample stained with 10x10 cm size or in accordance with the wishes of three pieces.Soak the textile material to be dyed in a solution of 2g / L neutral soap.Soaking for 2 hours. Then washed and cooled.

Cotton
Create a solution containing 8g $Al_2(SO4)_3$ and 2g of Na_2CO_3 in 1 liter of water. Stirring until dissolved. Boil the solution to the boil then enter cotton cloth and boiled for 1 hour and soak overnight. Furthermore fabric removed and dried.

Silk
Create a solution containing 8g $Al_2(SO4)_3$ in 1 liter of water stirring until dissolved. Heat the solution to 60 ° C for one hour and then fill with a constant temperature. After heating it stopped the fabric aside for one night. Remove and rinse the cloth and then dried. Mordent silk fabric that has been dipped in dye.

Preparation Of Fixer Agents

$FeSO_4$ fixer solution: prepared by dissolving 50g $FeSO_4$ into 1 liter of distilled water. Let it settle and take the clear solutions.$Al_2(SO_4)_3$ fixer solution: prepared by dissolving 50g $Al_2(SO_4)_3$ into 1 liter distilled water. Let it settle and take the clear solutions.$CaCO_3$ fixer solution: prepared by dissolving 50g $CaCO_3$ into 1 liter of distilled water. Let it settle and take the clear solutions.

Dyeing Process

Cut each fabric into 9 pieces.Enter each of which has been dried fabric into the dye for 15 minutes.Dip a cloth in each fixer solution for 5, 10 and 15 minutes.Lift the cloth that had been included in the fixer solution to a glass beaker containing 15 ml of distilled water for

5 minutes.Take the rinse water then place in cuvettes and observe using a spectrometer. Record the results.

RESULTS AND DISCUSSION

Suji leaf is a natural dye that is often used in Indonesia as a food coloring. Suji leaves have a green color or pigment called chlorophyll. When extracted by heating until the volume of water to 1/3, the results extractnya not be green like the color of the leaves at first. Pigment changes color at first is green and turns yellow brownish caused heating the extraction process. It was like a dried leaf that initially turns yellow brownish green. Heating resulted in the destruction of the pigment chlorophyll in the leaves. To avoid discoloration of the pigment in leaves is done by grinding the leaves become smaller and take the juice.

In the distilled water sample spectrometer observations indicate 0.065 , these figures indicate that the spectrum of light that is refracted through distilled water impurities resulting in no change in the wavelength spectrum. When a sample of each fabric is dipped into the fixer solution if the numbers represent a significant spectrometernya it means the level of fixer solution to lock low dye on fabric and vice versa.

Graphics For Spectrometric Analysis Result.

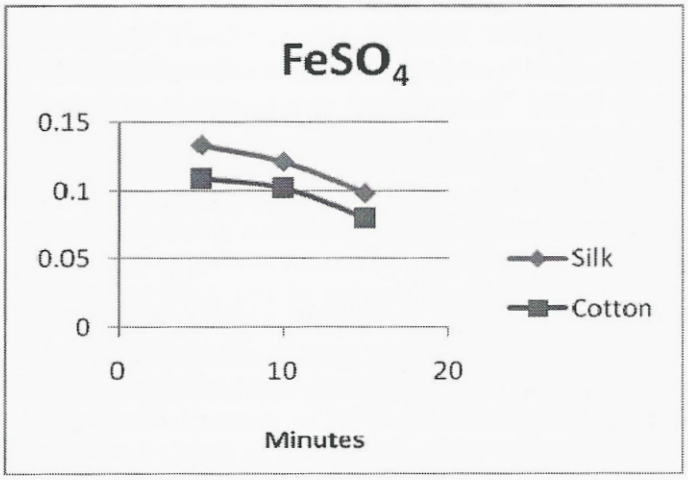

Figure 1. Profile of $FeSO_4$ fixer solution

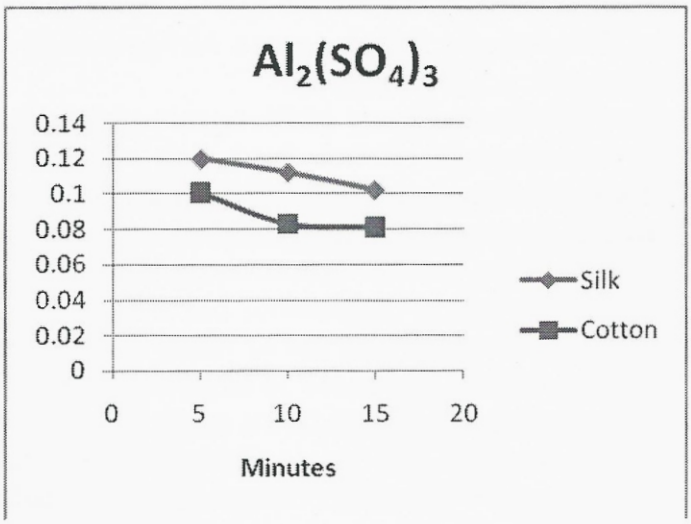

Figure 2. Profile of $Al_{2(}SO_4)_3$ fixer solution

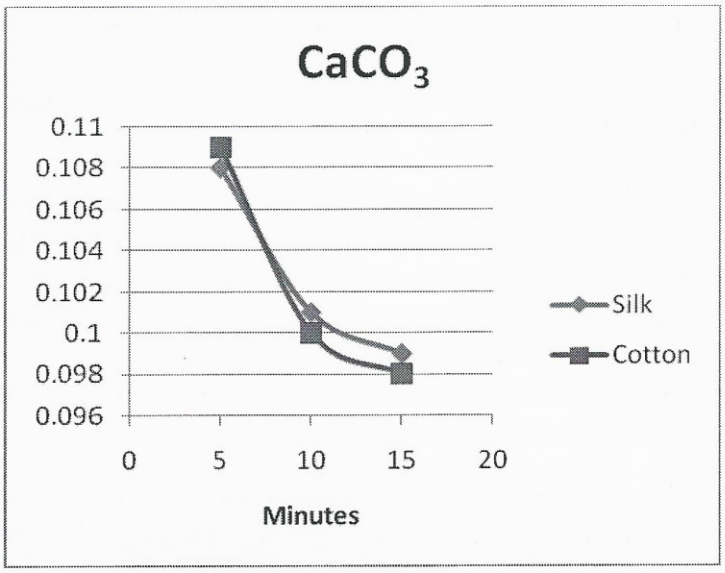

Figure 3. Profile of $CaCO_3$ fixer solution

From the graph above on every 5 minutes soaking in fixer solution mangalami decline spectrometer analysis. This shows the longer soaking in fixer solution, the fade level dye into the water to be on the wane. Decline in the near-distilled water spectrometry analysis means the ability to lock the fixer solution dye better. From the above data indicate that most good fixer solution is $FeSO_4$ and $Al_2(SO_4)_3$on cotton fabric by soaking for 15 minutes each showed 0.080 and 0.081 This figure approaching spectrometry analysis distilled water for 0.065. While a good fixer solution for silk fabric is $FeSO_4$ and $CaCO_3$ with the result 0.099 spectrometer analysis.

CONCLUSIONS

In the study, the optimum conditions in dyeing cotton and silk cloths. Which the fixer agents studied. And the time used in fixer agents. The results are based on spectroscopy photometer the best result in the cotton and silk cloth dying are $FeSO_4$ fixer agent and the best time use is 15 minute.

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