

## A Study on the Dyeing of Ramie Fabric Treated with Medicinal Plants

### II. The Natural Dyeing On Ramie Fabric Using *Artemisiae argyi* Herba

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#### ABSTRACT

This study was performed to investigate the effect of *Artemisiae argyi* Herba extract on the treatment of chromaticity and colorfastness. *Artemisiae argyi* Herba has been used as a Korean medicine. It is effective in removing skin disorders and suppressing pain. It is also good as a fungicide and in treating pruritis. In the long history of Korea, dyeing has been applied for a means representing the grace of natural and inner esthetic consciousness of man. Vegetable dyes give us such great benefits, diversified color, but no pollution. And ramie fabric has distinctive features such as beautiful brilliance, elegance, and strong durability. So, it is regarded as a special product of Korea traditionally. These studies were carried out to treat with acetate iron, dichloride copper and alum with a mordant to ramie fabric. The ramie fabric was died with *Artemisiae argyi* Herba extract. The results of experiment showed as follows:

First, the chromophoric degree was the highest in acetate iron but not distinction in another mordants. Second, the light colorfastness was the highest in non treated and dichloride copper, but alum was the lowest. Third, the discoloration was alum and dichloride copper showed first grade in washing colorfastness. Abrasion colorfastness was not significant in this test. According the previous results, *Artemisiae argyi* Herba has an efficiency in removing skin disorders and suppressing pain. So it is considered that *Artemisiae argyi* Herba can be applied effectively to therapy of fungicide and in treating pruritis.

**Key Words** : *Artemisiae argyi* Herba, ramie fabric, chromophoric, colorfastness, discoloration, climacteric disturbance

#### INTRODUCTION

In the long history of man, dyeing has been applied for a means of representing the grace of God and inner esthetic consciousness of man.

*Artemisia argyi*.(Compositae family) is perennial plant which grow widely in the tropical and temperate areas of the world(Lee, 1982).

Whole plants of *Artemisia argyi*. were gathered at the flowering time and dried. The whole plant tastes to be pungent and bitter. *Artemisia argyi*. is effective in

**Table 1.** Color differences by mordants

Fabric	Mordants	Temperature(℃)	Testing time (min)	chromophoric effect
Ramie-fabric	non-mordant	40~50℃	20~30	light ivory
	alum	40~50℃	20~30	green yellow
	acetate-iron	40~50℃	20~30	green
	dichloride copper	40~50℃	20~30	deep green

removing skin disorders and suppressing pain. It is also good as a fungicide and in treating pruritis is used for menstrual disturbances(Euk, 1981).

It's main compounds are cineole, thujyl alcohol, sesquiterpene alcohols(Euk, 1981). Vegetable dyes give us great benefits, with diversified color but no pollution. And the ramie fabric has distinctive features such as beautiful brilliance, elegance, and strong durability. Also it is regarded as a special product of Korea traditionally.

In these days, the convenient color is being needed more in our life as technology is developed day after day. But the synthetic dyestuff causes the side effects such as dermatitis, nasal inflammation, and allergy. And synthetic dyeing makes us be polluted. The high technology goes with non-pollution and the moderns take pleasure in natural color and desire the life without pollution(Lee et al, 1993).

But some kind of natural dyestuffs had anti-bacillus. When the ramie-fabric were dyed and treated with *Artemisia argyi*. extract, we found that the change of color and dyeing color fastness were occurred.

## MATERIALS AND METHODS

*Artemisia argyi*. was used to test dyeing plant. Testing material was ramie fabric. Acetate iron, dichloride copper, and alum were used for mordant.

Testing progress was as follows: Washing the dried *Artemisia argyi*. 1.2kg, soaking in water 12 l and boiled the soaked *Artemisia argyi*. It used for making first solution. Pour out the first solution, and then boiled with 8 l water to make second solution. and then I

made the third solution Third solution need 4 l water. Mixing whole solutions and preparing strained solution for the test.

The ramie-fabric was tamper with treatment for 10~20 minutes in 40~60℃ for soaked in dyeing solution. The ramie-fabric was soaked in dyeing solution at while testing for keep ramie-fabric from staining. This kind of treatments were repeated 2 or 3 times. The ramie-fabric was washed 5 to 6 times after it was dyed.

The ramie-fabric was mordant with acetate iron, dichloride copper and alum and treated for 20~30 min. After treating mordant ramie-fabric was washed many times. Each mordants weights were 2~3% per ramie-fabric weight.

## RESULTS AND DISCUSSION

### 1. Test of Colorimetry

The investigation was made for the purpose of finding out ramie-fabric mordant with *Artemisia argyi*. Color chart of Japan Inc-chemical company was used in this test. The colorimetry was shown in Table 1 and Table 2.

Testing temperature was 40~50℃ and testing time was 20~30 minutes. This test was carried out under the same condition. Non-mordant showed light-ivory color, alum showed ivory, acetate-iron showed fawn brown, dichloride copper showed light yellow. Ramie-fabric

**Table 2.** Variation of color chart by after mordanting with alum, acetate iron, and dichloride copper.

color sample	mordants	COLOR CHART
Japan Inc-chemical company	non-mordant	chart1
	alum	chart 4 (Y10%)
	acetate-iron	chart 5 (Y20%)
	dichloride copper	chart 3 (Y60%)
Doosung Paper (Designers color 139)	non-mordant	P58
	alum	G58
	acetate-iron	D59
	dichloride copper	N 2

**Table 3.** Colorfastness to light of fabric

mordants	Discoloration(grade)			
	non-mordant	Alum	Acetate-Iron	Dichloride copper
<i>Artemisia argyi.</i>	5	5	4	5

**Table 4.** Colorfastness to washing of fabric

mordants	non-mordant		Alum		Acetate-Iron		Dichloride copper	
	Discoloration	Pollution	Discoloraton	Pollution	Discoloration	Pollution	Discoloration	Pollution
<i>Artemisia argyi.</i>	4-5	5	4-5	5	4-5	5	3	5
	grade	grade	grade	grade	grade	grade	grade	grade

**Table 5.** Colorfastness to abrasion of fabrics

mordants	Pollution			
	non-mordant	Alum	Acetate-Iron	Dichloride copper
<i>Artemisia argyi.</i>	5grade	5grade	4-5grade	4-5grade

showed differences in color by mordants.

In Japan Inc-chemical company' s color sample, non-mordant showed chart 1, alum showed chart 4, acetate-iron showed chart 5, dichloride copper showed chart 3. In Doosung Paper' s color sample, non-mordant showed L59, alum showed p58, acetate-iron showed D59, dichloride copper showed N2.

Colorimetry was significant by each mordants.

## 2. Measure the colorfastness

Colorfastness of ramie-fabric dyed with mordants

was shown in Table 3. Table 4. and Table 5.

Investigation of light colorfastness was carried out used 4 kinds of ramie-fabric It was basked in the light 20hours. Discoloration has 8 grade. no-mordant, dichloride copper and alum' s grade is 5 and acetate-iron' s grade is 4. Discoloration was alum ,non-mordant and dichloride copper was higher grade than acetate-iron.

Investigation of washing colorfastness was carried out and used 4 kinds of ramie-fabric. It was tested by KS K0430 A-1. Discoloration was non-mordant, alum and acetate Iron was higher than dichloride. Pollution

was not significant in this test.

Investigation of abrasion colourfastness was carried out and used 4 kinds of ramie-fabric. The ramie-fabric was rubbed ten times by 900g weight per 10seconds. Abrasion colourfastness has 5 grades. Pollution was non-mordant and alum higher than acetate-Iron and dichloride copper in this test.

## REFERENCES

- Euk Chang Su, 1981, Korea Medical botany, Kye-Yun Munwha Publishing co. : 379
- Kim Kwang Soo, 1998, Studies on Dyeing with Natural Dyes, KonKuk University
- Lee Chang Bok., 1982, An illustrated book of the Korean flora : 651.
- Lee Hee Young and Lee Yang Sub., 1993, A Study on Fastness of Color-Green Dyeing, KonKuk University
- Markos, Staci Elizabeth. 2000 Evolutionary patterns in *Lessingia* and close relatives(Compositase, Astereae): Evidence from rDNA, morphology, and biosystematic data, University Of California, Berkely
- Morita, H., Gonda, A., Takeya, K., Itokawa, H., Hirano, T., Oka, K, and Shirota, O.(1997) Solution State Conformation of an Immunosuppressive Cyclic Dodecapeptide, *Cycloleonurinin*. *Tetrahedron* 53(22): 7496-7478.
- Sin Jun Sik, 1997, Treatment by Drinking Medicine Tea and Medicine Liquor, Kuk-II media : 204-205

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