

Study on Natural Dyeing Using the Elm-Bark

Kyoung Hun Song, Byung Hee Kim, Yu suk Choi, Soon Young Byun
Department of Clothing and Textiles, Pai Chai University

1: 40, 80, 60 가

A natural dyeing makes fabrics look unique and elegant which cannot be obtained by synthetic dyestuffs. The natural dyestuffs are harmless to human, and it is easy to get them. Also, the natural dyestuffs are environmentally friendly, which is the another merit for natural dyeing.

We investigated dyeability with several fabrics (cotton, wool, ramie, silk and nylon) using an elm bark. We investigated dyeability with elm under the conditions of various temperature, concentration, time and mordants (natural and synthetic). Also, colorfastness in dyed fabrics was estimated by laundering and light. The optimum condition of dyeability in elm bark was 60 min as time, 80 as temperature and 1: 40 as bath ratio. The dyeability in silk and nylon was the best among the sample. The treatment of mordants improved the dyeability and colorfastness in silk, wool and nylon. We obtained various color by the mordants.

Key words : natural dyeing, elm-bark, mordants effects, colorfastness, dyeability

가

가

가

가

가

(, 1997).

가

1.

100%

Table 1

Table 1. Characteristics of fabric samples

Material	Woven structure	Fabric counts (ends/picks/5cm)	Thickness (mm)	Weight (g/cm ²)
Cotton(100%)	Plain weave	132/155	0.26	0.25
Flax(100%)	Plain weave	111/121	0.25	0.31
Wool(100%)	Plain weave	146/168	0.23	0.25
Silk(100%)	Plain weave	223/256	0.07	0.15
Nylon(100%)	Plain weave	162/213	0.11	0.13

2.

100

1,200 m

30 g

500 ml

60

1

500 ml

60

2

1

2

3.

1)

1: 40

가
60

80

20%

0.3%

2)

(CuSO₄ · 5H₂O),

1

(, 1996).

(FeSO₄ · 7H₂O), (AlSO₃ · 14H₂O),
(SnCl₂ · 2H₂O)

0.3% 가
24 가

4.

CCDM(Color & Color Difference Meter(MODEL TC-8600 JAPAN))

5.

1)

KS K 0430 A-1

Launder-O-Meter

2)

KS K 0700 Carbon-Arc Fade-O-Meter (Model 18-F, Atlas)

1.

1)

30, 60, 90, 120 color difference meter

Fig.1 60 90 가

가

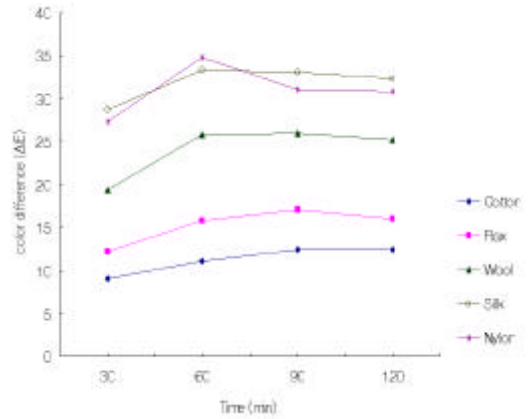


Fig. 1. Influence of time on dyeability.

2)

Fig.2

70, 80, 90, 100 60
80 가
80 가 가
가 가 가
100 가
80 100
가 100
80 가 가

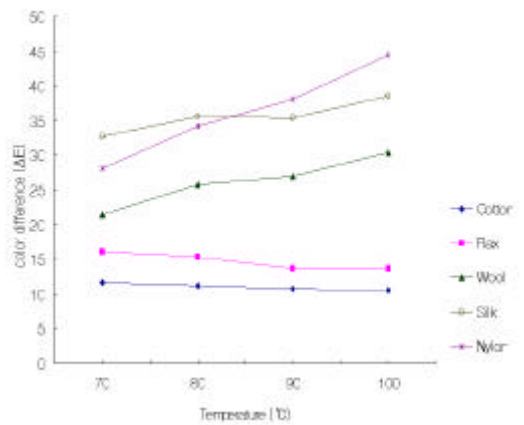


Fig. 2. Influence of temperature on dyeability.

3)

Fig.3

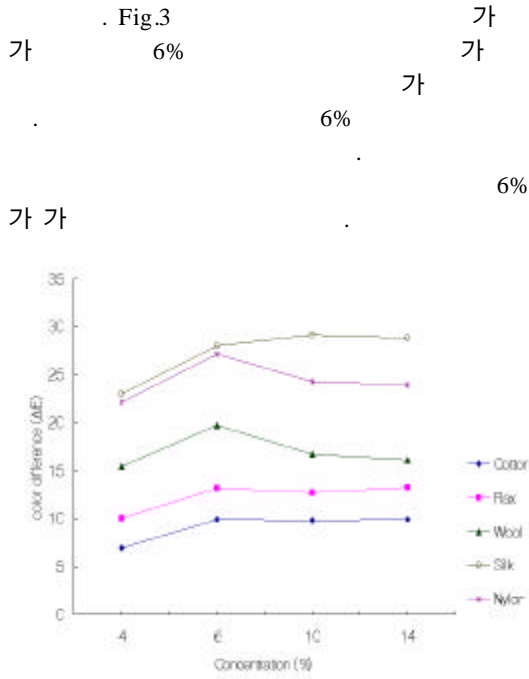


Fig. 3. Influence of concentration on dyeability.

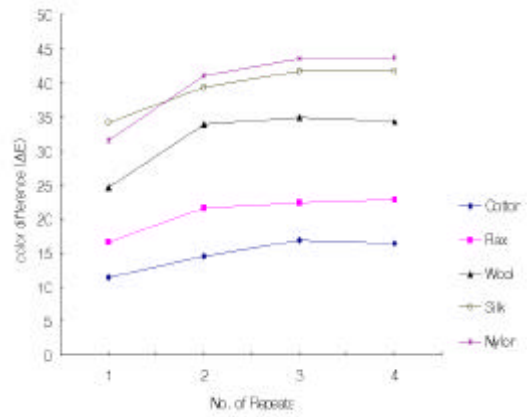


Fig. 4. Effects of repeats of dyeing on dyeability.

4)

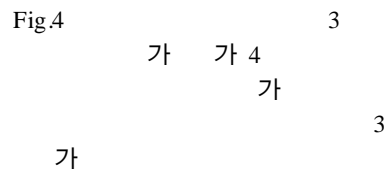


Table 2. Effects of mordants on dyeability onto cotton

Mordants	Pre-mordanting				Simultaneous mordanting				Post-mordanting			
	L	a	b	E	L	a	b	E	L	a	b	E
Non-mordants	81.42	3.75	10.09	11.00								
Cu	68.86	11.48	9.65	24.87	67.91	8.74	12.04	25.18	72.33	4.01	11.28	19.52
Fe	68.20	3.86	7.10	22.17	59.80	1.53	3.96	29.79	68.22	1.53	8.30	22.10
Al	76.54	5.25	11.20	15.51	75.71	4.70	12.40	16.63	80.32	2.90	10.04	11.25
Sn	74.02	8.72	16.32	22.27	87.31	1.85	7.76	5.77	85.24	2.55	8.02	7.19
Acorn	78.73	3.93	8.42	12.36	83.13	2.15	7.85	8.04	85.17	1.46	5.87	5.12
Persimon	79.01	3.98	9.22	12.70	83.77	1.83	7.35	7.28	84.97	1.06	5.59	5.15

5)

1: 40 60 80

Table 3

Table 2

1

가

Table 3. Effects of mordants on dyeability onto fax

Mordants	Pre-mordanting				Simultaneous mordanting				Post-mordanting			
	L	a	b	E	L	a	b	E	L	a	b	E
Non-mordants	78.59	6.13	9.77	13.86								
Cu	60.93	11.79	10.44	28.22	61.02	10.17	13.70	29.17	61.39	6.04	12.81	27.20
Fe	63.88	5.32	8.44	23.74	50.34	2.23	4.07	36.44	58.85	2.20	7.50	28.05
Al	70.89	5.86	12.08	18.62	70.93	5.62	14.51	19.67	73.85	5.56	13.27	16.75
Sn	68.75	12.08	17.17	23.23	85.22	0.63	9.79	4.05	78.95	6.40	11.56	10.36
Acorn	63.70	4.48	7.18	23.58	70.43	3.74	8.10	16.92	73.67	2.28	6.75	13.37
Persimon	69.89	5.73	10.48	17.74	74.97	3.00	9.28	11.87	73.47	2.36	7.67	12.83

Table 4

red yellow, - b Dark Geen Gray
 - a blue
 green
 가
 가
 1
 가
 . Fig 5
 +a

Table 4. Effects of mordants on dyeability onto wool

Mordants	Pre-mordanting				Simultaneous mordanting				Post-mordanting			
	L	a	b	E	L	a	b	E	L	a	b	E
Non-mordants	60.40	14.14	14.78	34.06								
Cu	46.24	10.57	12.62	40.40	50.59	6.47	14.75	35.32	44.87	6.61	11.80	40.58
Fe	39.68	4.10	6.21	45.06	44.40	1.60	4.70	40.27	38.37	1.71	3.16	46.44
Al	63.55	12.62	18.43	26.60	66.12	7.70	17.03	21.72	63.08	12.32	17.04	26.37
Sn	70.57	12.08	27.87	26.38	78.64	3.51	28.73	20.76	69.71	13.54	20.12	23.02
Acorn	60.92	13.46	16.20	29.29	65.62	12.22	15.52	24.73	64.05	12.64	14.14	25.94
Persimon	58.49	12.67	14.65	30.30	65.12	11.59	14.38	24.16	65.75	10.71	13.16	22.95

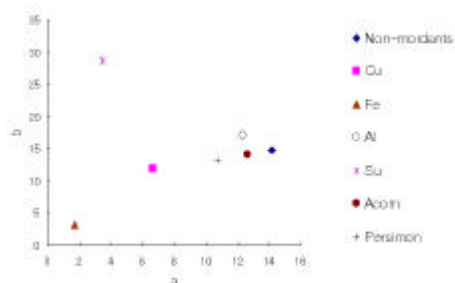


Fig. 5. Effets of mordants on color onto wool

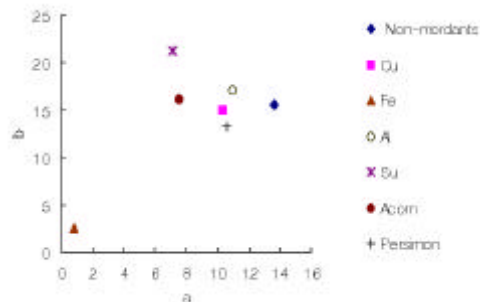


Fig. 6. Effets of mordants on color onto silk

Table 5

Fig.7

1

가

Table 6

Fig.6

1 a b

Table 6

가

Table 5. Effets of mordants on dyeability onto silk

Mordants	Pre-mordanting				Simultaneous mordanting				Post-mordanting			
	L	a	b	E	L	a	b	E	L	a	b	E
Non-mordants	60.83	13.61	15.54	33.76								
Cu	46.74	14.51	13.59	45.93	46.38	14.36	16.02	46.83	44.34	10.32	14.98	47.49
Fe	44.58	4.86	5.55	45.48	40.19	-0.19	4.15	49.36	32.78	0.81	2.48	56.84
Al	58.88	11.88	17.74	35.49	58.72	14.44	18.41	36.89	60.56	10.95	17.13	33.49
Sn	68.43	10.21	20.36	22.10	77.69	7.09	21.32	23.92	69.11	12.39	16.78	27.91
Acorn	59.29	10.21	16.03	34.57	65.43	10.35	16.68	29.90	65.67	7.58	16.16	28.47
Persimon	59.63	11.28	13.90	34.08	66.41	13.08	15.80	30.17	64.68	10.58	13.20	29.29

Table 6. Effects of mordants on dyeability onto nylon

Mordants	Pre-mordanting				Simultaneous mordanting				Post-mordanting			
	L	a	b	E	L	a	b	E	L	a	b	E
Non-mordants	50.82	23.13	19.46	47.60								
Cu	52.39	17.30	12.68	40.52	56.67	13.98	17.19	36.81	52.71	12.63	13.16	38.56
Fe	61.34	9.94	17.93	32.40	55.33	2.41	10.27	33.66	53.80	12.08	12.95	37.96
Al	60.72	13.81	19.07	34.76	62.07	10.70	19.88	32.91	60.75	13.30	17.45	33.78
Sn	66.98	10.10	21.91	29.73	78.38	1.24	18.70	17.92	65.54	18.12	16.46	31.85
Acorn	61.09	13.94	20.40	34.83	61.71	19.79	17.76	36.25	62.64	19.19	16.07	34.59
Persimon	57.70	16.80	19.41	38.58	63.41	15.18	16.67	32.28	61.86	16.41	15.34	33.59

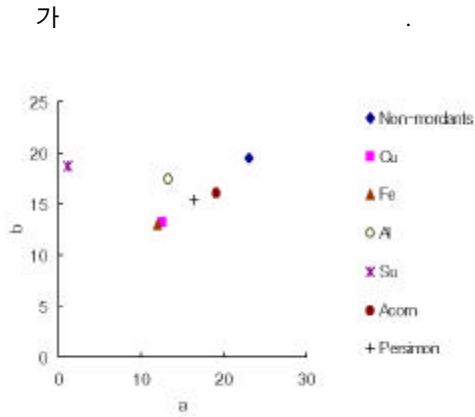


Fig. 7. Effects of mordants on color onto nylon.

2.

Table 7 N. B. S. unit

1. 6%, 80 가 60 1: 40

2. 가

3. 가

1,2 가 3, 4

Table 7. Colorfastness to laundering (and Grade)

Mordants	Cotton		Flax		Wool		Silk		Nylon	
	Grade	Grade	Grade	Grade	Grade	Grade	Grade	Grade	Grade	
Non-mordants	7.80	2	10.02	2	12.05	1	7.42	2	13.54	1
Cu	1.21	5	1.88	4	4.28	3	8.51	2	2.46	4
Fe	3.04	3	4.5	3	4.49	3	4.72	3	4.19	3
Al	2.73	4	11.62	2	8.94	2	6.87	2	7.32	2
Sn	0.98	5	0.75	5	9.02	2	5.99	3	0.68	5

Table 8. Colorfastness to sunlight (Grade)

Mordants	Cotton	Ramie	Wool	Silk	Nylon
Non-mordants	2	1	3	4	1
Cu	1	1	4	2	1
Fe	2	2	3	4	1
Al	3	1	4	4	1

4. 가 1, ()- 1996. 가
. 8(4): 52-58.

5. 1 ()- 가
7(4): 374-386.

6. 가 가 가 ()- 가 가
가 가 7(4): 87-96.
. 1997.
(). 가
. 9(6): 33-41.
. 1994.

7. 1996. 21(4):
661-668.
. 1997. 21(3):
600-606.
. 1996. ().
21(1); 228-236.
. 1995.
20(3): 429-437.
. 1997. 21(5):
911-921.
. 1984.
. 1992.