

AT KESTANESİ (AESCULUS HIPPOCASTANUM L.)'NDEN BOYARMADDE EKSTRAKSİYONU VE KÜRK BOYAMA

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ÖZET

Bu çalışmada kürk boyamada yeni bir gelişme kaydedildi. Boyama işlemlerinde at kestanesindeki kabuğunda bulunan aesculin ve $K_2Cr_2O_7$, $AgNO_3$, $CuCl_2$, $FeSO_4$ gibi geçiş elementlerinin tuzları kullanılarak onbeş adet alternatif kürk rengi elde edildi.

EXTRACTION OF DYESTUFF FROM CHESTNUT (*Aesculus Hippocastanum L.*) AND FUR DYEING

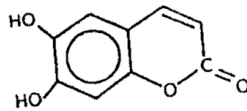
SUMMARY

In this study, a new development was carried out in dyeing of fur. The natural dye aesculin which chestnut was used in dyeing processes and fifteen alternative fur colours were obtained using some transition element's salts such as $FeSO_4$, $CuCl_2$, $AgNO_3$, $K_2Cr_2O_7$.

INTRODUCTION

The use of synthetic substances is replaced by natural substances due to the number various disadvantages they have.

Natural dyes are of growing interest in recent years¹ but there have not been and study recorded so far on *Aesculus hippocastanum L.* This is the first research in which dyeing specialities of chestnut outer-shell was investigated through the mordantation method².



Aesculin

Aesculin, 6,7-dihydroxy coumarin, has three auxochrome groups (-OH and C=O)³. This substance was isolated by extraction from chestnut and used in dyeing. Natural colours of high quality were attained. Hence the chestnut can be introduced as a new dyeing agent regarding the manufacturing of more durable fur in textile industry as well as in other industrial usages.

EXPERIMENTAL

Soxhlet apparatus was used to extract the dyestuff from chestnut. All of the solvent used during the experiment such as n-hexane and water were redistilled before using. Solvent was evaporated with Buchi RE III rotary evaporator. Light fastness tests were made with Fadeometer (Xenotest), Washing fastness tests were made with Alas Launderometer LHTP model, Crocking fastness tests were made with Crockmeter 225 model.

Extraction of Dyestuff from Chestnut (*Aesculus hippocastanum* L.)

Dried outer-shell of chestnut (100 g) was allowed 24 h in 1000 ml of distilled n-hexane to separate terpenes. After decantation, the residue was extracted with 1000 ml of distilled water by using the Soxhlet apparatus. This solution was used as dye-bath for dyeing of fur. The total dyestuff was found 2.26 %. This value is composed of aesculin which is known earlier³.

Dyeing of Fur Samples

The three methods for fur dyeing are Pre-mordantation, Together mordantation and Last mordantation⁴.

In this work, the second method, together mordantation, was applied. During this study, the sheep feathered leather was used. The length of feather of white feathered-leather is approximately 1-1.5 cm and the area is 10 cm² and the weight is 1 g.

Together mordantation: The feathered leather, 100 ml of dyestuff solution and mordant agent were mixed in 250 ml of Erlenmeyer flask. This mixture was shaken at frequent intervals for 1.5 h at 35-40°C and finally, dyed feathered-leather was filtered, washed with distilled water and dried.

RESULTS AND DISCUSSION

Colour codes, mordant, mordant mixture and pH values were given in **table I**. and fastness tests were given in **table II**.

Table I. Colour codes, mordant, mordant values and pH of dyed fur samples.

Colour Codes	Mordant, mordant mix.	Amount of mordant g/100 ml	pH
18-0920 TP olive	$\text{AgNO}_3 + \text{FeSO}_4$	0.5+0.5	4
19-1158 TP chestnut	SnCl_2	0.5	4.5
19-0812 TP coffe	FeSO_4	1	4.5
18-1222 TP cocoa brown	$\text{K}_2\text{Cr}_2\text{O}_7 + \text{CuCl}_2$	0.5+0.5	4.2
17-1019 TP elmwood	$\text{CuCl}_2 + (\text{NH}_4)_6\text{Mo}_7\text{O}_{24}$	0.5+0.6	3.9
17-1422 row unber	$\text{AgNO}_3 + \text{K}_2\text{Cr}_2\text{O}_7$	0.4+0.7	4.4
17-1312 TP silver mink	$\text{FeSO}_4 + \text{AgNO}_3$	1+0.5	4.5
18-1130 TP aztec	$\text{FeSO}_4 + \text{AgNO}_3$	1+1.3	4.1
17-4402 TP neutral gray	$\text{FeSO}_4 + \text{AgNO}_3$	0.5+1	3.8
19-1020 TP dark earth	$\text{FeSO}_4 + \text{AgNO}_3$	1.5+0.5	4.4
18-1016 TP cub	$\text{FeSO}_4 + \text{AgNO}_3$	0.5+0.6	3.9
18-0920 TP kangroo	$\text{FeSO}_4 + \text{AgNO}_3$	0.8 +0.5	4.
19-3938 TP twilight blue	$\text{FeSO}_4 + \text{AgNO}_3$	1+0.5	4
18-1312 TP deep taupe	$\text{FeSO}_4 + \text{AgNO}_3$	1+0.6	4.8
16-1341 TP butterun	$\text{FeSO}_4 + \text{AgNO}_3$	0.7+0.5	4.2

Table II. Fastness tests of dyed fur samples.

Color code	Liquor ratio	Bath temp (°C)	Dyeing period (h)	Light fastness	Crocking Fastness		Washing fastness
					moist	dry	
18-0920 TP	1:100	35-40	1.5	43-4	4-5		5
19-1158 TP	"	"	"	4-5	4	4-5	5
19-0812 TP	"	"	"	43-4	4		5
18-1222 TP	"	"	"	4-5	4	4	5
17-1019 TP	"	"	"	5	4	5	4-5
17-1422 TP	"	"	"	4	4	5	5
17-1312 TP	"	"	"	43-4	4-5		4-5
18-1130 TP	"	"	"	4	4	4	4-5
17-4402 TP	"	"	"	4-5	4	4-5	4-5
19-1020 TP	"	"	"	5	4	4	4
18-1016 TP	"	"	"	4-5	4	4-5	4
18-0920 TP	"	"	"	4	4	4	4
19-3938 TP	"	"	"	4-53-4	4		4-5
18-1312 TP	"	"	"	4	4	4	4-5
16-1341 TP	"	"	"	4-53-4	4		4

Liquor ratio was chosen 1:100 as dyeing of wool. Bath temperature must be 35-40 °C. Because, leather shrinks at higher temperatures (>40°C) and dyeing process doesn't give a good result at lower temperature (< 35°C)⁵. Dyeing period was determined since the fur colours formed by scanning between 1/2 h and 2 1/2 h.

Every colours can not be considered as fur colours. Suitable fur colours must be special. For instance, 17-4914 TP (deep teal), 18, 1112 TP (walnut7, 17,1410 TP (fine bark), 19-4205 TP (phantom, 19-1102 TP (licorice), 19-1420 TP (deep mahogany) are desirable colours⁵.

In dyeing of samples. FeSO₄ and AgNO₃ were used mostly. Because, the most desirable fur colours were obtained with these mordants. 18-1222 TP, 18-1130, 18-1016 and 18-0920 are very suitable alternative fur colours according to the some fur

colours obtained syntetic dyestuffs such as 19-4914 TP, 18-1112 TP, 17-1410 TP, 19-1102 TP and 19-1420 TP. All of the pantone codes of these samples were made as visual and fastness tests were made using grey scale^{6,7}.

Desirable results were obtained from dyeing studies of fur samples. This subject was also investigated widely for the first time. This research has directly a lot to do with leather (fur hooded, jacket and shoe) industry.

In addition, surface of leather was dyed mostly opposite colour of the feather surface.

For example:

Pale brown	leather surface	dark brown	feathered surface
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Together mordant method applied in this study is an continue process. This method can be adapted in fur industry and is very usefull for other dye-plants. Further studies are underprogress.

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