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RESEARCH ARTICLE

Effect of Reetha and Hinganbet on strength of Degummed and Dyed Silk

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ABSTRACT

This study conducted on Effect of Reetha and Hinganbet on Strength of Degummed and Dyed Silk in this study reetha and hinganbet were used for degumming of silk sample. Three different concentrations 2, 4, and 8 grams on weight of fabric were determined. Degumming was carried out at 60^0C 1:50 M: L ratio and Degummingtime 30 and 45 min was maintained during the degumming process. Degummed samples were mordanted it was carried out at 90^0C, ML ratio 1:50 it was maintained during process.buteamonosperma flowers were used for dyeing degummed silk,and Ml ratio was kept 1:50 dyeing was carried out with 60^0C for 60 minutes. Tearing strength of degummed and dyed samples of reetha and hinganbet were determined by tearing strength tester. It was observed that when degumming was done with reetha powder less g/f was required to tear the fabric on warp wise as well as weftwise gain. except in the sample degummed with 2% reetha prior. For both 30 and 45 minutes slightly greater force was required to tear along the warp wise and weft wise grain. On the contrary all the samples degummed with hinganbet powder required force to tear along warp wise and weft wise grain.

Keywords: Reetha, Hinganbet, Degumming, Mordanting, Dyeing, Silk.

INTRODUCTION

"Silk is considered as the queen of fabric" even today. Its strength, luster, softness and graceful lines in which it hangs, makes it the most attractive all textiles. Silk has been one of the most popular fabrics because of its unique properties. Soft supple, strong & lighter in weight than any other natural Fiber, Silk is prized for its lightness with warmth sheerness with strength & delicacy with resiliency (Corbman, 1985). The process of degumming "Removal of sericin from raw silk fabric is called as degumming process" (Dentyagi, 1977)

Today several soaps are available. Natural soaps have been considered the safest type in the market because they do not contains dangerous chemicals, that could damage the skin or organs of the body when ingested while most soaps today contains chemicals and properties that are used

offset the effects of hard water environmentally friendly manufacturers are focusing on the importance of producing eco-friendly soap. After many studies scientist have discovered that soaps designed to clean are actually polluting our environment eco friendly soaps do not contain synthetic chemicals that could potentially harm the user and the environment. Soaps are mainly used as surfactants for washing bathing and cleaning but they are also used in textile spinning and are important components of lubricants (Brucelee).

Reetha A deciduous tree found wild in North India usually with 5-10 pairs of leaves, solitary with large drupes this tree belongs to the main plant order sapindaceae and family sapindeae. The *sapindus mukorossi* (Gaertn) tree is one of several that bear fruits that are commonly refered to mukorossi tree have the highest saponin content saponin is a natural detergent commonly refered to as soap nuts, studies have shown that saponin from soap nuts inhibit tumor cell growth, soap nuts are one among the list of herbs and minerals in Ayurveda (Sapindus mukorossi the complete soap nut guide, 2009).

Hinganbet Botanical Name *Balanites aegyptica* (L.) Delile. Habitate in India Bihar, Deccan Gujarat, Uttarpradesh (Kanpur) and Sikkim. It is a spiny tree, about 6m height, branches glabrous or punberulous and ending in very strong a scending spines, leaves alternate, bifloliate, ashy green leaflets coriaceous cymes auxiliary 4-10 flowered, flowers green, velvety pubscent, fruits avoid about 5 cm in length, fleshy drupes, 1 seeded seed oily but exalbuminou. May: fruiting winter. Riyas, 2010)

Palas *Butea monosperma* (Lma.) Taub – palas tree family fabaceae, it is medium sized dry season deciduous tree, growing to 15 m tall, The leaves are pinnate with an 8-16 cm petione and three leaflets, each leaflet 10-20 cm long the flowers are 2.5 cm long Bright orange – red and produced in racemes up to 15 cm long the fruits is a pod 15-20 cm long and 4-5 cm broad. (Gihan Jayaweera**)**

MATERIALS AND METHODS

Natural soap Reetha (*Sapindus mukorassi*) (gaertn) and Hinganbet (*Balanites aejyptica*) (L.) Delile were used for study. Palas *(Butea monosperma*) (Lam) Alum *(Aluminum potassium sulphate)* and Tin *(Stannous chloride)* were used.

In order to make fabric more absorbent, to obtain level dyeing and penetration of dyestuffs and degumming of silk fabric was done. Standard procedures were adopted for degumming. Three different concentrations 2, 4, and 8 grams on weight of fabric were determined. Degumming was carried out at 60^0C 1:50 M: L ratio was maintained during the degumming process. Optimum time for degumming was determined at 60^0C with 1:50 M: L ratio. Time intervals for degumming were 30 and 45 minutes respectively. Degumming was carried out with reetha and hinganbet as natural sources of soap.

The flowers of butea monosperm (lam) (Palas) were collected from the nearby area in the month of march. Flowers were washed to remove dust and other impurities and used for the extraction of the dye. Extraction of dye from fresh palas flowers was carried out. Prior to mordanting and dyeing process, fresh flowers 60% (O.W.F.) were taken M: L ratio for extraction was 1:50 and it was maintained during the extraction. Extraction was carried out for 30 minutes at 90^0C.

Mordanting was done for all the experimental (degummed) samples. Total 12 silk samples with 2 different soap concentrations for two different time periods were degummed prior to mordanting. All the degummed samples were mordanted in a separate mordanting bath. 10% alum in combination with tin in 9:1 proportion was taken in to make the process more eco friendly. Mordanting was carried out at 90^0C for 45 minutes with M:L ratio as 1:50 liquor ratio was maintained during the mordanting time with constant handling of silk samples.

Dye bath was prepared with previously prepared aqueous extract of butea monosperma flowers. M: L ratio was kept 1; 50 dyeing was carried out at 60^0C for 60 minutes. Degummed silk sample was entered in to the dye bath initially at 40^0C and slowly it was raised up to 60^0C. Dyeing was continuing with constant handling of sample in the dye bath. Material to liquor ratio was maintained during the dyeing process. The dye bath was then allowed to cool at room temperature. Sample was removed and rinsed thoroughly and shade dried. The dyeing process was repeated for all the experimental samples separately.

Tearing strength of degummed and dyed samples of reetha and hinganbet were determined by tearing strength tester. Tearing strength was determined by measurement of work done in tearing through a fixed length of the test specimen using the Elmendorf tear tester .Template size of samples was used for measuring strength. (Anonymous (1971).

RESULTS AND DISCUSSION

From the table it was observed that sample degummed with reetha the tearing force was gradually decreased with increasing soap concentration in both warp and weft wise force. The same trend was found with the sample degummed with 30 and 45 minutes.

After dyeing it was observed that the warp wise tearing force was gradually increased with all the concentrations of reetha 30 and 45 minutes. Whereas for weft wise sample it was found that initially decreased in tearing force with increasing soap concentration for both 30 and 45 minutes. Table also showed that the sample degummed with hinganbet the highly significant difference was found in both warp and weft wise strength, also the same trend was found for all the concentration. After dyeing it was found that the tearing force was moderately increased with using three different concentrations both warp and weft wise degummed samples.

Table 1: Tearing strength of silk before and after dyeing

Soap conc.	Degumming Time.	Tearing strength g/f Wp 1308 Wf 1196							
		Reetha				Hinganbet			
		Strength before Dyeing.		Strength after Dyeing.		Strength before Dyeing.		Strength after Dyeing.	
		Wp.	**Wf.**	**Wp.**	**Wf.**	**Wp.**	**Wf.**	**Wp.**	**Wf.**
2%	30	1290	1195	1300	1198	1310	1200	1350	1230
	45	1285	1193	1305	1199	1300	1204	1348	1241
4%	30	1289	1191	1300	1193	1384	1216	1399	1264
	45	1279	1190	1307	1194	1392	1264	1399	1277
8%	30	1280	1180	1305	1195	1390	1280	1400	1294
	45	1278	1170	1309	1180	1424	1288	1450	1297

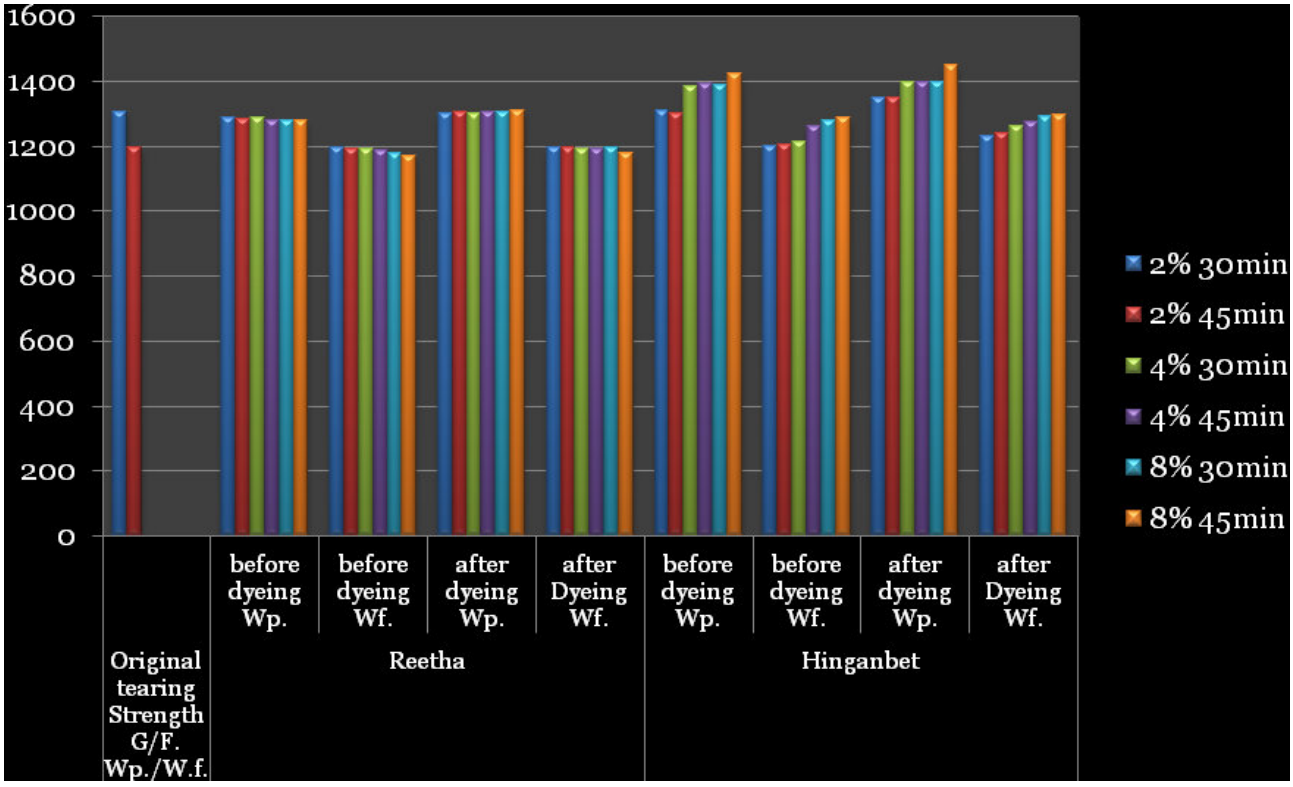

Fig.1: Tearing strength of silk before and after dyeing

Study was carried out the degumming of muga silk fabric by biosurfactant. This study evaluates efficiency of Reetha a biodegradable natural surfactant in aqueous solution to solubilize sericin and other foreign materials, in muga silk fabric CMC value of reetha solution in aqueous medium was found to be 0.017 g/cc (1.7 wt%) and surface tension (ST) of aqueous medium remaind constant at 38.6 MN/M under degumming trails weight loss was found to be 18.28% at CMC value of Reetha solution treated for 36 h at RT. It was observed that CMC value of Reetha solution, ST was least and degumming maximum. (Sarma, Gogoi, Borgohain and Goswami, 2012).

From the result it can be said that when degumming was done with reetha powder less g/f was required to tear the fabric on warp wise as well as weft wise gain. except in the sample degummed with 2% reetha prior. For both 30 and 45 minutes slightly greater force was required to tear along the warp wise and weft wise grain. On the contrary all the samples degummed with hinganbet powder required force to tear along warp wise and weft wise grain.

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