

DEVELOPMENT OF LINEN AND BAMBOO FABRICS FOR THE APPLICATION OF TODA EMBROIDERY

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Abstract: The aim of this work concerns the development of 100% linen and bamboo fabric in mock leno weave for the application of Toda embroidery on men's, women's and kid's garments and accessories. In India Todas are found in the Nilgiri District of Tamilnadu state. Toda tribes are famous for their traditional embroidery called Toda embroidery, which is less known craft to the outside world. Toda embroidery now found in their traditional cotton shawls and its weave structure is 2x2 basket weave. The present study was undertaken with the aim to develop linen and bamboo fabrics in mock-leno weave structure. The finished linen and bamboo fabrics were undergone basic tests for analysing the physical properties. The study would be a step forward to impart new dimensions to the fashion world.

Keywords - *Toda Embroidery, Bamboo Fabrics, Linen Fabrics, Mock Leno Weave, 2x2 basket weave.*

I. INTRODUCTION

The culture of India is the way of life of the people of India. The Indian culture often labelled as an amalgamation of several cultures, spans across the Indian subcontinent. This is mainly because of the difference in the ethnicity of people, availability of the indigenous textile materials, influence of ecology, customs, tradition etc. India has a diverse and rich textile tradition. Traditional clothing in India greatly varies across different parts of the country and is influenced by local culture, geography, and climate and ritual urban settings. Decorating materials with embroidery is an ancient tradition and reveals about the lives and customs of particular cultures. Embroidery is a manifestation of the artistic creativity of the people. Each part of India has contributed much to the style of embroidery characteristics to its own tradition and culture. Contribution from Tribe's are praise worthy for continued research in embroidery, its technique and pattern with the introduction of common objects like flowers, animals, trees etc in their day to day life. Tribal people of the world over have always had a great flair for decoration and ornamentation. Banjara tribes of Gujarat, Rajasthan, Andhra Pradesh, Rabari tribes of Gíri region, Ahri pastoral tribes, Lambadis (Gipsy tribes), tribal people of Assam and Toda of Nilgiri are doing embroidery on their various garments.

In India, Todas are found in the Nilgiri District of Tamilnadu State. The Todas are a small community who live on the isolated Nilgiri plateau. Toda tribes are also famous for their unique embroidery called 'Toda embroidery' which is less known craft to the outside world. The Toda women during their leisure time, engage themselves in an indigenous embroidery where a coarse, unbleached hand woven white cotton cloth is embroidered with 'Pukaor' (motif) basically in geometrical forms of flower, animal and natural objects. The embroidered shawl is called "Puthkuli" and they use steel needles and woollen threads, chiefly of black and red colours. The unbleached nature of hand woven white cloth helps in identifying the yarn gauge (count of threads) quite easily. Young Toda girls inherit the craft by observing the works done by the elders of the community. The motifs are inspired by nature and daily life. The main motif is the buffalo horn as the Toda worship buffalos. Other designs include wild flowers, mountains and valley.

The present study focuses mainly on giving new dimensions to this traditional embroidery. Toda embroidery now only found in cotton shawls and some limited accessories. They are using 2x2 basket weave structures to identify the yarn gauge. Since an effort has been taken to develop linen and bamboo fabrics in mock-leno weave for the application of Toda embroidery on apparels and accessories. It also aims at making an indigenous art known to the outside world and to commercialize this traditional craft.

The study would be a step forward to impart new dimensions to the fashion world. The objective of the research works are as follows.

- To develop linen fabric in mock-leno weaves.
- To develop bamboo fabric in mock-leno weaves.
- To test the basic parameters of the developed fabrics.

II.METHODOLOGY

The methodology refers to the research procedures and techniques used to develop linen and bamboo fabrics in mock leno weave for the application of Toda embroidery. All the aspect of research procedure followed has been divided into the following headings.

2.1. Selection of Yarn

Linen and bamboo yarns where selected for the fabric development .The details of the yarns are mentioned in the table 2.1

Table 2.1 details of the yarn used for the development of linen and bamboo fabrics

SL NO.	YARN TYPE	COUNT	CONTENT
1	linen	26n m x 26n m	100% linen
2	bamboo	60's	100% bamboo

2.2 Fabric Development

Both Linen and Bamboo fabrics were developed in mock-leno weave to obtain the yarn gaps. This weave structure helps to apply the embroidery in an easy manner. The traditional Toda embroidered shawl is developed in 2*2 basket weave structure. An effort has been taken to introduce new weave structure for the application of Toda embroidery on newly developed linen and Bamboo fabrics to obtain yarn gaps. The fabrics were developed in mock-leno weave to obtain the yarn gap. The Toda embroidery is woven in intricate manner by means of darning, counting of threads or yarn Gaps. Since the mock leno weave helps to obtain the yarn gaps easily.

The weave structure of Linen and bamboo fabrics are given in figure 3.1

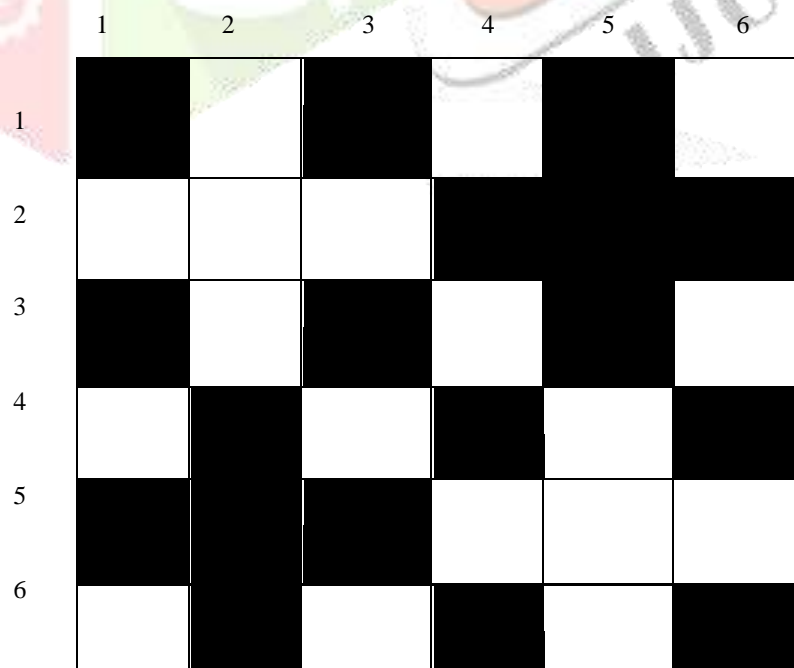


Figure 2.1 weave structure of - mock-leno weave

2.3 Fabric Processing

The linen and bamboo fabrics were undergone pre-treatment processes like scouring and bleaching. Two different types of linen fabrics were developed one is bleached fabric and another one is unbleached. Its warp yarns are bleached and its weft yarns remain natural in colour. The developed bamboo fabric was undergone scouring process.

2.4 Testing of the Developed Fabric

The finished linen and bamboo fabrics were undergone basic testing methods. The various test methods used on the finished samples are given below.

Fabric Count

Ends per inch and picks per inch of the fabrics were measured as per ASTM D 3775 using counting glass at 10 different places for each sample and an average was taken for further analysis.

Fabric Weight

Fabric weight was found as per ASTM D 3776 by GSM cutter and electronic weighing balance at different parts of the fabric sample.

Tensile Strength

Tensile strength of the fabric was found by grab test (ASTM D5034) method. In the grab tensile test the central part of the specimen's width was tested in the grips. The specimen of size 100 mm x 150 mm long was pulled to break at 300 mm/min (12 in/min) and the breaking strength was measured. The grab test was taken for ten fabric samples of each linen and bamboo fabrics.

Tearing Strength

Tearing strength of the fabrics was measured by Elmendorf tear tester as per ASTM 1424. It is a pendulum type ballistic tester which measures energy loss during tearing. The dial reading was taken from the scale and the tearing strength was calculated using the following formula

Tearing strength in kg = Dial reading x strength in kg

Abrasion resistance

Abrasion resistance of the fabric was measured by Martindale abrasion tester as per ASTM standard D4157-13. The fabric sample was rubbed against an abrading surface by multi directional motion. Assessment of abrasion is done by comparison between original cloth and abraded sample. The developed fabrics were shown in plate 2.1 to 2.3

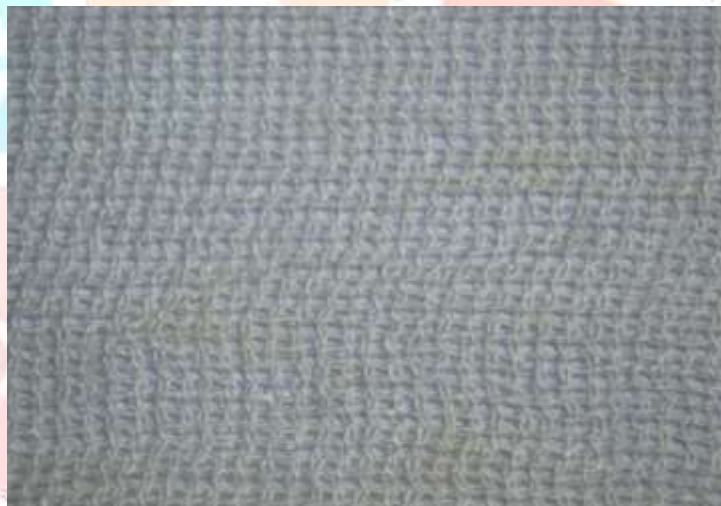


Plate 2.1 Developed bamboo fabrics in mock leno weave



Plate 2.2 Developed linen fabrics in mock leno weaves (Natural)



Plate 2.3 Developed linen fabrics in mock leno weaves (white)

II.1. RESULTS AND DISCUSSION

The developed fabrics were undergone different testing parameters.

3.1 Testing of the developed fabric

The Gram per Square Metre (GSM), Ends Per Inch and Picks Per Inch (EPI and PPI), abrasion resistance, tensile strength and tearing strength of the fabric were tested. The test results are given in table 3.1

sl no.	parameters	linen (bleached)	linen(natural)	bamboo
1	gram per square metre(gsm)	144	156	83
2	ends per inch and picks per inch(epi and ppi)	epi-52	epi-54	epi-60
		ppi-48	ppi-48	ppi-64
3	abrasion resistance	6800-7300	7000-7500	6500-7000
4	tensile strength	warp-64.7	warp-56.6	warp-19.58
		weft-75.8	weft-69.6	weft-13.64
5	tearing strength	warp-7600	warp-7500	warp-2624
		weft-7550	weft-7460	weft-2560

From the above Table 3.1 it was found that the GSM of bleached linen fabric was 144 and natural linen fabric was 156 and bamboo fabric was 83. The EPI and PPI of linen (bleached) fabric was 52 and 48, and linen (natural) was 54 and 48 respectively. For the bamboo fabric the EPI and PPI was 60 and 64 respectively. The abrasion resistance of the linen

(bleached) fabric was 6800-7300 and linen (natural) was 7000-7500 and bamboo fabric was 6500-7000. The tensile strength of linen (bleached) fabric was (warp) 64.7 and (weft) 75.8 Linen natural fabric was (warp) 56.6 and (weft) 69.6 . The tensile strength of the bamboo fabric was (warp) 19.58 and (weft) 13.64. It was found that tearing strength of the linen (bleached) fabric warp was 7600 and weft was 7550 and linen natural fabric the tearing strength was (warp) 7500 and (weft) 7460. In bamboo fabric the tearing strength was (warp) 2624 and (weft) was 2560. The Toda embroidery was applied on the developed linen and bamboo fabrics were shown in plate 3.1 to 3.3



Plate 3.1 Toda embroidery was applied on developed linen fabric



Plate 3.2 Toda embroidery was applied on developed bamboo fabric



Plate 3.3 Toda embroidery was applied on developed bamboo fabric

SUMMARY AND CONCLUSION

Decorating materials with embroidery is an ancient tradition and reveals about the lives and customs of particular cultures. Embroidery is very ancient craft popular throughout India. Tribal people of the world over have always had a great flair for decoration and ornamentation.

In India Todas are found in the Nilgiri district of Tamilnadu state. The Todas are a small community who lives isolated Nilgiri plateau. Toda tribes are also famous for their unique embroidery called Toda embroidery which less known craft to the outside world. Few efforts are being taken by government and their NGO's to preserve Toda embroidery art. However much needs to be done to showcase their skill to the outside world. Since Toda tribes are reducing rapidly their embroidery also is in danger of becoming extinct. The present study focuses mainly on giving new dimensions the traditional embroidery.

Toda embroidery now only found in cotton shawls and some limited accessories. Since an effort has been taken to develop 100% linen and bamboo fabrics in mock-leno weave for the application of the Toda embroidery on apparels and accessories. The developed fabrics were undergone basic testing like GSM, EPP,PPI, tensile strength, tearing strength and abrasion resistance.

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