

# Application of oak tasar waste silk and viscose blended fabrics for apparel purpose

■ Pooja and Sandeep Bains

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■ **ABSTRACT** : Application of oak tasar waste silk and viscose blended fabrics for apparel purpose has been studied. Oak tasar silk waste was blended with viscose fibre in three different ratios, viz., 60s: 40v, 50s: 50v and 40s: 60v on worsted spinning system. Knitted fabric samples were then prepared on circular knitting machine. Properties of resultant yarn and knitted fabric were evaluated. The developed blended fabrics were subjectively analyzed for their end use applications for women's wear, men's wear, children wear and home textiles. It was found that, in case of women's apparel, the respondents preferred fabric samples  $S_1$  and  $S_2$  for making shrugs and fabric samples  $S_3$  and  $S_4$  were preferred for making ponchos. When talking about men's apparel, fabric sample  $S_1$ ,  $S_2$ ,  $S_3$  and  $S_4$  followed same trend of rating. First rating was given to mufflers. In case of children wear, caps were mostly preferred by respondents for fabric  $S_1$ ,  $S_2$  and  $S_3$  whereas sweater was mostly preferred for fabric sample  $S_4$ . As far as the use of developed blended fabrics for home textiles was concerned, first rank for fabrics  $S_1$ ,  $S_2$  and  $S_3$  was obtained by bed sheets and pillow covers and fabric  $S_4$  obtained first rank for making quilt covers.

■ **KEY WORDS**: Oak tasar waste, Ranking, End use, Blended fabrics

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See end of the paper for authors' affiliations →

**Pooja**

Department of Apparel and  
Textile Science, Punjab  
Agricultural University,  
Ludhiana (Punjab) India  
Email : poojakaundal0007@  
gmail.com

Every consumer wants quality and aesthetically appealing fabrics. Every fabric produced on handloom, power loom or in the mill sector, needs to perform the intended functions satisfactorily. Performance of these functions depends primarily on constructional details of the cloth (Kulkarni and Mahale, 2008). The balance of aesthetic performance and price in the choice of fibers has inevitably led to the production of blends. A blend is an intimate mixture of fibres of different length, diameter or colour spun together into a yarn. Blending is done to improve fabric construction, to

obtain better texture, hand and for economic reasons. The major reason of blending of natural as well as synthetic fibres is to improve the functional properties of yarn as well as fabric. When different types of fibres are combined or blended, the properties of individual fibres combine to produce modifications in the blended yarn (Tripathi *et al.*, 2013).

Looking into aesthetics of the textiles fibres, the first name that strikes our mind is silk. Silk, the glorious gift of nature is an intimate natural fibre which is also popular with splendor, sibilant with luster and spectacular

in vision. India is the only country in the world which produces all the four varieties of silk namely mulberry, eri, tasar and muga. The non-mulberry silks viz., tasar, eri and muga are collectively called as Vanya silks (Kulkarni *et al.*, 2011).

Silk fabrics in the ancient times were meant for the powerful and rich. Now with the change of times anybody can buy silk products and use them without reservation. However, silk is still the most expensive and sought after fabric. The tasar silk is produced from the wild variety of silk worms, *Antheraeamylytta* or *Antheracaproylei* species that thrives on the food plants *Asan* and *Arjun*. The fabric varies from a medium to heavy in weight. Tasar silk is valued for its texture and purity as it is naturally available in shades of honey, tawny, gold-pale, cream, dark beige, etc. In India, tasar silk is produced in the states of Jharkhand, Chattisgarh, Orissa, Maharashtra, West Bengal and Andhra Pradesh (Kariyappa *et al.*, 2007).

Blends combine the positive attributes of each of its components, minimize the negative characteristics and economize the cost of the material. Blending also provides a fabric which has aesthetic properties and can be put into different kinds of new end uses, thus, opening the way for product diversification. Blending of silk with rayon has advantage over blending of silk with cotton and synthetic fibres. Rayon is more versatile and uniform than cotton as it is manmade fibre. It scores over synthetics, being the biodegradable fibre and thus, causes fewer burden to ecosystem (Gahlot and Pant, 2011).

Unlike mulberry silk, not many efforts have been made to bring this wonderful fibre in the forefront of fashion. Thus, an attempt was made to use the oak tasar in blend with viscose fibre to exploit the outstanding positive attributes of each fibre and at the same time offer an effective means of minimizing the negative characteristics present in both the fibres. Also blended yarns were knitted to construct higher quality of fabric.

In the present study oaktasar waste and viscose fibres were blended in different proportions (60 s: 40 v, 50 s: 50 v and 40 s: 60 v) for preparing yarns of 15 Nm and 20 Nm count. Six blended yarns were developed. Out of six yarns four blended yarns were selected for further development of knitted fabrics on the basis of results of yarn strength, yarn evenness and yarn moisture regain. The selected yarns were knitted using circular knitting technique and four different single jersey fabrics were developed

The developed blended fabrics were analyzed for their end use applications for women's wear, men's wear, children wear and home textiles. Subjective evaluation was carried out to analyze the end uses of the developed fabrics. A panel of 30 judges comprising of members of advisory committee as well as faculty and PG students of Dept of Apparel and Textile Science, PAU Ludhiana were selected as they were having basic knowledge of apparel and textile science hence, proper evaluation was carried out. Data based on the ranking of expert's opinion is presented in Tables 1 to 4.

It is evident from Table 1 that, the respondents

Women's wear	S <sub>1</sub> 60 silk : 40 viscose (20 Nm)		S <sub>2</sub> 50 silk : 50 viscose (15 Nm)		S <sub>3</sub> 40 silk : 60 viscose (15Nm)		S <sub>4</sub> 40 silk : 60 viscose (20 Nm)	
	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks
	Sweater	9.03	10	7.87	10	7.87	9	7.87
Cardigan	10.77	11	10.87	11	10.87	11	10.87	11
Tops and tunics	5	5	4.90	4	4.33	3	4.33	3
T shirts and polos	6.40	8	6.20	7	6.40	8	6.53	8
Robes	4.50	4	4.37	3	6.23	7	6.37	7
Leggings	6.27	7	6.93	9	5.80	5	5.80	5
Poncho	4.0	2	4.23	2	2.70	1	2.70	1
Stole	4.40	3	5.70	6	4.53	4	4.40	4
Shrug	2.80	1	3.13	1	3.13	2	3.13	2
Muffler	5.33	6	5.20	5	5.90	6	5.90	6
Gloves	7.50	9	6.60	8	8.23	10	8.10	10

preferred S<sub>1</sub> blended fabric for making shrugs with weighted mean score 2.80, followed by poncho (4.0 II rank), stole (4.40, III rank), robes (4.50, IV rank), tops and tunics (5, V rank) and cardigan was least preferred with WMS as 10.77. Similarly S<sub>2</sub> fabric was preferred to be used for shrug (3.13, I rank) followed by poncho (4.23, II rank), robes (4.37, III rank), tops and tunics (4.90, IV rank), muffler (5.20, V rank) and last rank was given to cardigan.

It is clear from table that, preferences for fabrics S<sub>3</sub> and S<sub>4</sub> were same with equal scores and ranking.

Poncho was given rank I with WMS 2.70, followed by shrug (3.13, II rank), tops and tunics (4.33, III rank), stole (4.40, IV rank), leggings (5.80, V rank). Whereas, least preference was given to cardigan for all the four fabrics.

In case of men's apparel fabric sample S<sub>1</sub>, S<sub>2</sub> and S<sub>3</sub> followed same trend of rating. First rating was given to mufflers, followed by T shirts and polos, gloves and then sweaters. Least preference was given to cardigan. Whereas, in case of fabric S<sub>2</sub> first preference was given to mufflers (1.47), followed by gloves (2.20, II rank), T

**Table 2 : Analysis of blended fabrics for men's apparel based on expert opinion (n=30)**

Men's wear	S <sub>1</sub> 60 silk : 40 viscose (20 Nm)		S <sub>2</sub> 50 silk : 50 viscose (15 Nm)		S <sub>3</sub> 40 silk : 60 viscose (15 Nm)		S <sub>4</sub> 40 silk : 60 viscose (20 Nm)	
	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks
	Sweater	4.0	4	3.97	4	3.60	4	3.60
Cardigan	4.73	5	4.77	5	4.60	5	4.60	5
T shirts and polos	2.60	2	2.60	3	2.47	2	2.47	2
Muffler	1.50	1	1.47	1	1.83	1	1.70	1
Gloves	2.17	3	2.20	2	2.50	3	2.63	3

**Table 3 : Analysis of blended fabrics for children wear based on expert opinion (n=30)**

Children wear	S <sub>1</sub> 60 silk : 40 viscose (20 Nm)		S <sub>2</sub> 50 silk : 50 viscose (15 Nm)		S <sub>3</sub> 40 silk : 60 viscose (15Nm)		S <sub>4</sub> 40 silk : 60 viscose (20 Nm)	
	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks
	Sweater	1.90	2	1.60	2	2.63	2	1.23
Pant (pajami)	2.27	3	2.47	3	3.13	4	2.73	2
Cap	1.83	1	1.77	1	1.37	1	3.0	3
Socks or booties	4.0	4	5.0	5	2.87	3	3.03	4
Mittens	5.0	5	4.0	4	5.0	5	5.0	5

**Table 4 : Analysis of blended fabrics for home textiles based on expert opinion (n=30)**

Home textiles	S <sub>1</sub> 60 silk : 40 viscose (20 Nm)		S <sub>2</sub> 50 silk : 50 viscose (15 Nm)		S <sub>3</sub> 40 silk : 60 viscose (15Nm)		S <sub>4</sub> 40 silk : 60 viscose (20 Nm)	
	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks	Weighted mean scores	Ranks
	Khes/ light weight top sheet	3.77	5	3.67	4	3.40	3	2.03
Curtains	6.73	7	6.73	7	6.20	7	7.0	7
Throws	6.03	6	6.13	6	5.87	6	5.87	6
Cushion covers	3.50	3	4.07	5	4.37	5	3.93	4
Quilt cover	2.60	2	2.60	2	2.17	2	2.00	1
Bedsheet and pillow covers	1.80	1	1.60	1	1.50	1	3.37	3
Bolster cover	3.53	4	3.20	3	3.70	4	4.17	5

shirts and polos (2.60, III rank), sweaters (3.97, IV rank) and least preference was given to cardigan.

It can be observed from Table 3 that, fabric samples  $S_1$  and  $S_2$  followed almost same trend of ranking except for last two ranks. Caps (WMS 1.83, 1.77) were mostly preferred by respondents followed by sweater (WMS 1.90, 1.60) and then pant or pajama (WMS 2.27, 2.47) for fabric  $S_1$  and  $S_2$ , respectively. Last rank was given to mittens (5.0, V rank) in case of fabric  $S_1$  and socks and booties were least preferred in case of fabric  $S_2$ . Again in case of fabric sample  $S_3$  first rank was given to cap (1.37) but second rank was given to sweater with WMS 2.63, followed by socks and booties (2.87, III rank), pant or pajama (3.13, IV rank) and last rank was given to mittens (5.0, V rank). On the basis of preferences given to fabric  $S_4$  it was found that sweater was given first rank with WMS 1.23, followed by pant or pajama (2.73, II rank), cap (3.0, III rank), socks and booties (3.03, IV rank) and last rank was that of mittens with WMS as 5.0.

As far as the use of developed blended fabrics for home textiles was concerned, first two and last two ranks for fabrics  $S_1$  and  $S_2$  were same. First rank was that of bed sheets and pillow covers (1.80 and 1.60, respectively) followed by quilt covers (2.60 each) and last rank was given to curtains (6.73 each), followed by throws (6.03, 6.13, respectively). In case of fabric  $S_1$  third rank was obtained by cushion covers (WMS 3.50) followed by bolster cover (3.53, IV rank) and khes or light weight top sheet (3.77, V rank). Whereas, third rank was obtained by bolster cover (WMS 3.20) in case of fabric  $S_2$  followed by khes or light weight top sheet (3.67, IV rank) and cushion covers (WMS 4.07).

For home textiles blended fabric  $S_3$  was most

preferred for bed sheets and pillow covers, followed, by quilt covers (2.17, II rank), khes or light weight top sheet (3.40, III rank), bolster cover (3.70, IV rank), cushion covers (4.37, V rank) and lowest preference was obtained by curtains (6.20, VII rank), followed by throws (5.87, VI rank). Fabric  $S_4$  obtained first rank for making quilt covers with WMS 2.0, followed by khes or light weight top sheet (2.03, II rank), bed sheet and pillow covers (3.37, III rank), cushion covers (3.93, IV rank), bolster cover (4.17, V rank) and last rank was obtained for making curtains (7.0) followed by throws (5.87, VI rank).

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Authors' affiliations:

**Sandeep Bains**, Department of Apparel and Textile Science, Punjab Agricultural University, Ludhiana (Punjab) India

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