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Research Paper

Development of silk *Kurtis* with tie and dye technique using natural dyes

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■ **ABSTRACT :** Natural dyes are colouring substances that are obtained from plants, animals, insects and minerals. Their usage has seen a sharp decline because of easy availability of synthetic dyed products at an affordable price in the market. Even if consumers are willing to buy natural dyed products as a part of their social responsibility towards environment, availability of contemporary apparel products dyed with these sustainable dyes and having unique design features have to be strengthened. The present study is an attempt in this direction and aims at developing silk *Kurtis* with tie and dye technique using natural dyes. Five natural dyes and tannic acid mordant were purposively selected for the study. The selected dyes were *Arjun*, Golden drop, *Kilmora*, *Brahmi* and Madder. Eighteen designs for silk *Kurtis* were made by the investigator using CAD with combination of different style features and placement of tie and dye patterns. These designs were evaluated by a panel of ten experts on basis of overall appeal of the *Kurti*. The shortlisted six *kurti* designs were constructed using silk fabric and were shown to a sample of forty five respondents. All the respondents ranked the prepared *Kurtis* as excellent or very good and considered the estimated price of *Kurtis* as adequate. Thus, the consumer acceptance of the prepared *Kurtis* is an indication for the retailers and manufacturers to take up natural dyes for contemporary to earn good profit and run a sustainable enterprise.

■ **KEY WORDS:** Contemporary, *Kurti*, Quoted price, Sustainable

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Natural dyes are most commonly obtained from plants and insect bases. Most of the plant dyes are obtained from leaves, stems, barks, seeds, flowers, roots etc. Many studies have been conducted on natural dyes based on which standardized procedures have been developed for extraction of locally available plants and their use as dyes. Approximately, about 422 different shades have been obtained using varied plant sources (Yadav, 2002). Natural dyes produce unique, earthy, soothing, soft and pastel shades as compared to synthetic dyes. On the contrary, synthetic dyes which are widely available in the market at a reasonable price and produce bright and vibrant colours may cause skin allergy and other harmful effects on human body. Apart from health hazards, they also pose great chemical hazards for the environment during their manufacturing due to release of harmful chemicals. Natural dyes are eco friendly and have better biodegradability and

generally have higher compatibility with the environment. Also, natural dyes are non- toxic, non-allergic to human skin, non-carcinogenic and easily renewable in nature (Kulkarni *et al.*, 2011).

Objectives :

– To make *kurti* designs digitally and study expert preferences for them.

– To develop silk *Kurtis* using natural dyes with tie and dye technique.

– To evaluate the prepared *Kurtis* and study their consumer acceptance.

■ RESEARCH METHODS

Five natural dyes were selected according to their availability and shade produced. *Kilmora* for yellow, *Arjun* for light brown, Madder for dark brown, *Brahmi* for green and Golden drop for grey colour were selected. Tannic acid mordant was selected due to its eco friendly nature.

Optimized dyeing recipe for the selected dyes and mordant were documented from secondary sources like thesis, dissertations, books and reports.

Eighteen designs of silk *Kurtis* were developed on CorelDrawX5 keeping in mind the latest trends in *Kurtis* in terms of length, silhouette, necklines and sleeves. Different tie and dye patterns and their placements were used to produce unique designs.

The developed designs were shown to a panel of ten experts comprising of faculty members of Department of Apparel and Textile Science, College of Home Science, PAU and they were requested to rank the designs on the basis of their overall appearance.

Six most preferred *Kurti* designs according to experts were selected for further construction.

Silk fabric was procured from the local market and it was tied according to the selected designs. Keeping in mind the optimized recipes, dyeing was undertaken in the Department.

Selected *Kurtis* were constructed according to the standard measurements of 34" dress form

To study the consumer acceptability of the prepared *Kurtis*, a sample of forty-five respondents who were College going girls in the age group of 20-30 years were randomly selected. The *Kurtis* were evaluated on the basis of overall appearance on a five point scale of excellent, very good, good, fair and poor. The respondents were also asked about cost effectiveness of prepared *Kurtis.*

■ RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Designing of silk *Kurtis* on Corel Draw :

Six trendy styles and three different types of necklines and sleeves were selected for designing silk *Kurtis* according to latest trends. Three variations of each *kurti* style were developed with change in the type, colour combination and placement of tie and dye patterns. Thus, a total eighteen designs were developed. For easy identification, all the designs were numbered from D1 to D18. The developed designs are illustrated below:

Selection of most preferred designs :

The developed designs of *Kurtis* were shown to a panel of ten experts and they were requested to rank the designs from I to III for each style on the basis of overall appearance of the *Kurtis.* The most preferred *kurti* was ranked I and the least preferred as III.

It was observed from the above table that D1was most preferred design from *Anarkali* style with maximum weighted mean score (WMS) 2.1. The first rank in A-line style was given to D5 with weighted mean score 1.6. For the center cut *kurti,* D7 with weighted mean score (WMS) 2.1 was preferred as the best design by the experts. For the C- shaped hem *kurti,* D12 with weighted mean score (WMS) of 0.9 was given the first rank. For the straight and paneled *kurti,* design D13 and D16 were given first ranks with maximum weighted mean scores (WMS) 2.1 and 1.8, respectively.

Tieing and dyeing of silk fabric :

The silk fabric was procured and tied according to the selected designs and dyeing was undertaken in the Department according to the optimized dyeing recipes as given in the Table 2.

Construction of *Kurtis:*

For the construction of *Kurtis*, a standard medium size of 34" dress form was preferred. The measurements taken were: Length of *Kurtis* – below knees, Across shoulder – 15", Bust – 34", Waist – 26" and Hip – 36".

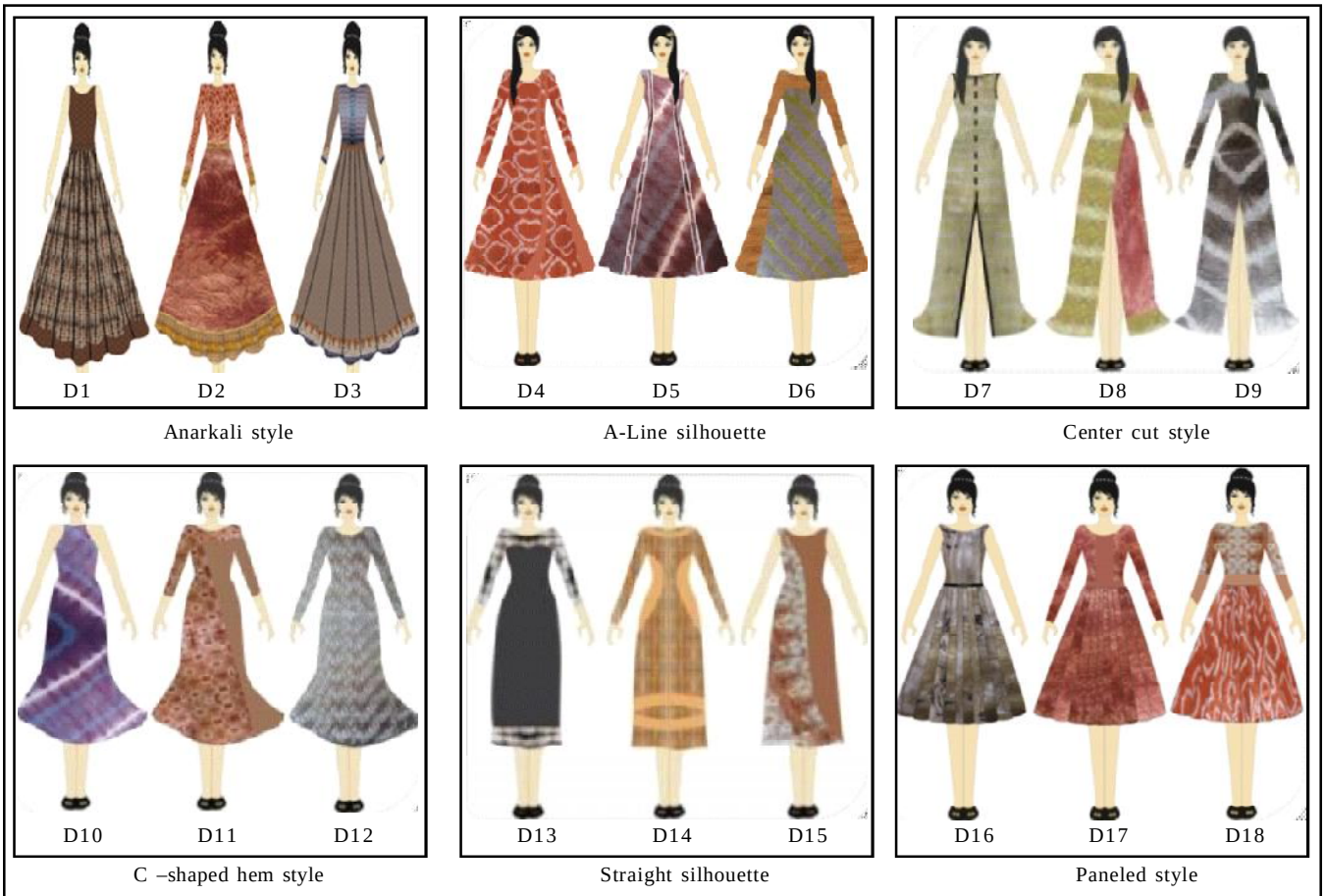


Plate 1 : Designed silk *Kurtis*

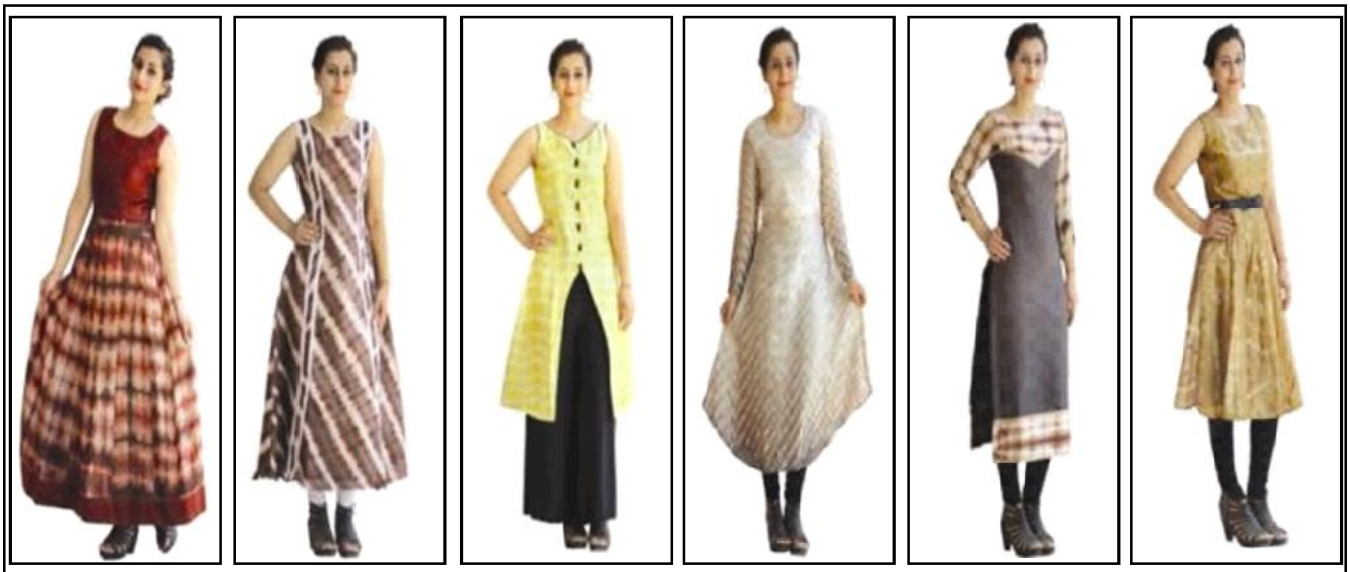
Table 1 : Preferences of Experts for the designed *Kurtis* **(n= 10)**

Kurti style	Designs	Weighted mean scores (WMS)	Ranks
Anarkali	D1	2.1	I
	D2	0.6	II
	D3	0	III
A-line	D4	0	III
	D5	1.6	I
	D6	0.2	II
Center cut	D7	2.1	I
	D8	0.4	II
	D9	0.1	III
C-shaped	D10	0.1	II
	D11	0	III
	D12	0.9	I
Straight	D13	2.1	I
	D14	0.3	II
	D15	0.2	III
Paneled	D16	1.8	I
	D17	0.8	II
	D18	0	III

Table 2 : Optimized dyeing conditions of selected natural dyes*

Name of dye	Dye(g) / g of silk	Dyeing time(min)	Temperature (^{o}c)	Mordant (g) / g of silk	Mordanting method
Arjun	2	45	120	0.04	
Madder	2	60	120	0.04	
Kilmora	3	60	120	0.04	Simultaneous
Golden drop	4	60	120	0.04	
Brahmi	10	60	120	0.05	

**Arjun* - Annual Report, AICRP (2002-2003); Madder - Singh *et al* (1993);
Kilmora - Verma (2007); Golden drop- Cheema (1998); *Brahmi* - Gohil and Patel (2010)



Anarkali *Kurti* | A-Line *Kurti* | Center cut *Kurti* | C–shaped hem *Kurti* | Straight *Kurti* | Paneled *Kurti*

Plate 2 : Prepared silk *Kurtis* using tie and dye technique with natural dyes

Cost estimation for the prepared *Kurtis* :

The cost of raw material *viz*., silk fabric, lining, fusing, accessories (buttons, laces and zippers), dye, dyeing and stitching cost were taken into account for calculating the cost incurred in construction of *Kurtis*. Further profit @30% was added to each *Kurti* cost to calculate the estimated cost.

Kurti codes	Cost price (Rs.)	Estimated price after addition of profit (Rs.)
D1	3470	4530
D5	2695	3500
D7	2179	2830
D12	3036	3950
D13	2175	2830
D16	2960	3850

Evaluation of the prepared *Kurtis* on the basis of overall appearance :

The prepared *Kurtis* were shown to a sample of forty-five college going girls to evaluate them on a five point scale. The result is shown below:

It was observed from the Table 1 that maximum number of respondents (68.89%) considered D1 as excellent. D5 was considered very good by maximum number of respondents (55.56%). Majority of the respondents (44.45%) considered D7 as very good. D12 was considered excellent by 48.89% respondents. D13 and D16 were also considered excellent by maximum numbers of respondents *i.e.* 46.67% and 48.89%, respectively.

Preference towards estimated price of prepared *Kurtis :*

The respondents were asked to evaluate whether the estimated prices of *Kurtis* were high, low or adequate. The results are presented in Table 4.

It was apparent from the Table 4 that the majority

Table 3 : Evaluation of the prepared *Kurtis* on the basis of overall appearance (n=45)

Kurti codes	Excellent		V Good		Good		Fair		Poor	
	F	%	f	%	F	%	f	%	f	%
DI	31	68.89	10	22.22	4	8.89	-	-	-	-
D5	15	33.33	25	55.56	5	11.11	-	-	-	-
D7	15	33.33	20	44.45	9	20.00	1	2.22	-	-
D12	22	48.89	16	35.56	5	11.11	2	4.44	-	-
D13	21	46.67	17	37.78	6	13.33	1	2.22	-	-
D16	22	48.89	12	26.67	11	24.44	-	-	-	-

Table 4 : Preference towards estimated price of prepared *Kurtis*

Kurti codes	Estimated price of *Kurtis* (Rs.)	High		Adequate		Low	
		f	%	f	%	F	%
D1	4530	9	20.00	34	75.56	2	4.44
D5	3500	11	24.44	32	71.12	2	4.44
D7	2830	5	11.11	35	77.78	5	11.11
D12	3950	13	28.89	30	66.67	2	4.44
D13	2830	7	15.56	36	80.00	2	4.44
D16	3850	15	33.33	28	62.23	2	4.44

of respondents considered the price for D1, D5, D7, D12, D13 and D16 as adequate.

Conclusion :

The liking of consumers for the prepared *Kurtis* as excellent and very good and their adequate price point towards the potential of such *Kurtis* in taking up an enterprise for commercial production. The developed *Kurtis* will add more variety to the existing style in the market to meet the ever changing fashion requirements of the customers and will also encourage the use of natural dyes for contemporary articles. Natural dyes are recommended to use over direct dyes for tie and dye technique to produce soothing colours and avoid the harmful effects that is created due to disposal of direct dyes in the environment. Further, it is also recommended to make such products available in the market so that customers may buy these as a part of social responsibility for saving the environment.

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