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Sudha Babel
Principal Scientist, Deptt of
Textiles & Apparel Designing,
College of Community and
Applied Sciences MPUAT,
Udaipur, Rajasthan, India

Latika Sanchihar
Research Fellow, Deptt of
Textiles & Apparel Designing,
College of Community and
Applied Sciences MPUAT,
Udaipur, Rajasthan, India

Market potentials of ecofriendly printed products using natural thickening agent and natural dyes by the consumers

Sudha Babel and Latika Sanchihar

Abstract

Mango (*Mangifera indica* L.) is one of the most favoured and commercially valuable fruit growing throughout the tropics and is used in a variety of food products. Considerable amounts of mango kernels (seeds) are discarded as waste after industrial processing of mangoes (Puravankara, Bohgra, & Sharma, 2000). Depending on the variety, mango kernels contain 6.0% protein, 11% fat, 77% carbohydrate, 2.0% crude fiber and 2.0% ash, based on the dry weight average. For successful commercial use of natural dyes, the appropriate and standardized printing techniques need to be adopted without scarifying required quality of printed textiles materials. Therefore, to obtain newer shades with acceptable colour fastness behavior and reproducible colour yield, appropriate scientific techniques or procedures need to be derived from scientific studies on preparation of printing paste, printing process variables, printing kinetics, compatibility of natural dyes with natural thickening agent. Eco friendly substance as alternative to toxic synthetic dyes, chemicals and thickening agents is utmost priority for the researchers and industrialists. The growing demand for eco friendly and sustainable products is playing an important role in promoting use of natural dyes and thickening agents. In the present study fabric were printed by block and screen printing technique using natural dye and natural thickening agent. And printed fabric further processed into value added, home furnishing and apparel products and assess their suitability at various parameters. An attempt was made to explore the market potentials of Eco friendly printed products, for this purpose sixty respondents were purposely selected. Block and screen printed products like stole, table cover, bed sheet, scarf, duppatta, sari border, necktie, magazine holder and letter holder were hand printed using natural starch obtained by Mango kernel and natural dye concentrate. Opinion of sixty respondents was obtained. Results revealed that all the printed products were liked by all the respondents. Respondents were ready to pay 20-50 per cent profit for the Eco friendly printed products.

Keywords: Mango kernel starch, eco friendly printed products, market potentials

Introduction

Natural products exhibit better biodegradability and generally have a higher compatibility with environment. In the recent years concern for environment has created an increasing interest in eco-friendly, biodegradable and nontoxic rational products. Basically printing is a form of dyeing in which the colour is applied to specified area. The resulting multicolored patterns have attractive and artistic effects which enhance the value of fabric. To resist the colouring matter to the design area, it is pasted with thickening agent which may be natural or synthetic. Thickeners impart stickiness and plasticity to the printing paste so they can be applied to a fabric surface without spreading and are capable to maintaining the design outlines. Today due to environmental awareness use of natural dyes is growing. Production and application of synthetic dyes release large amount of waste and unfixed colourant causing health hazards. Pollution disturbs eco balance. The most alarming and injurious to health is presence of toxic chemicals in finished textiles, especially which are coming in contact with skin has opened new challenges for persons working in the field of textiles.

People who are concerned about the environment know that one of the best advantages of cotton is that it is environmentally friendly. Not only cotton is biodegradable, it is also a renewable resource. Many people who are concerned with the environment chose to get clothes that are made with organic cotton. Cotton is known for its versatility, performance and natural comfort. It's used to make all kinds of printed textiles.

Corresponding Author:
Latika Sanchihar
Research Fellow, Deptt of
Textiles & Apparel Designing,
College of Community and
Applied Sciences MPUAT,
Udaipur, Rajasthan, India

Plant products are attractive alternatives to synthetic products because of biocompatibility, low toxicity, environmental “friendliness” and low price compared to synthetic products. Thickening agents from natural products are also generally non-polluting renewable sources for the sustainable supply. Natural starches obtained from plants have diverse applications in textile printing.

Mango (*Mangifera indica*) is an important fruit crop cultivated in tropical regions, belonging to Anacardiaceae family. India is the largest producer of mangoes in the world. After industrial processing of mango and extraction of oil from mango kernel, considerable amounts of mango kernels are discarded as waste, usually termed as total waste, has sufficient amount starch. Approximately 40-60% waste is generated during processing of mango, out of which peel and kernel constitute 12-15% and 15-20%, respectively. Identification of native starch sources like mango kernel starch is required for desired functionality and unique properties. The kernel obtained after decortications of mango seeds was utilized. Taking into the consideration the need of eco textiles Mango kernel starch has been tapped to explore as a source of natural thickening agent for sustainable development. Natural dye concentrate was prepared and used to impart the colour. Block and screen printing techniques was used to develop eco-friendly printed products. The objective of present study is to find out the market potentials of eco-friendly printed products by the consumers.

Methodology

Plain white cotton fabric was purchased from market. Scouring was done in order to remove the impurities from the fabric. The fabric was pre treated with 20 percent of myrobalan (*Terminalla chebula*) solution for 24 hours

maintaining the 1:20 MLR (material to liquor ratio) the fabric was squeezed in both warp and weft direction and sun dried. The side exposed to sunlight was darker and was used for printing. Dye extract was prepared by Indigo dyes. Copper Sulphate and Ferrous Sulphate was used as mordants. Mango kernel starch was used as thickening agent for preparing printing paste. All the printing paste was applied to the fabric through screen and block printing technique. Printed samples were after treated with Alum. Fixation of printed goods was done by steaming at 125°C for 30 min.

To assess the market potentials thirty respondents and thirty market personnel using or dealing with natural dyed and printed products were selected purposively. A rating scale was developed consisting of statements related to market potential of developed products. (Cost of printing paste, cost of raw materials, labour charges and profit gained). Data was analyzed using frequency and percentage.

Results and Discussions

In order to assess the market potential of the natural thickening agents and natural dyes printed products researcher estimated the cost of all products. While estimating the cost of the product parameter considered were cost of the raw material, enrichment cost and labour charges. Profit ranging from 20- 50 per cent was added and consumers and marketing personnel were asked to rate the preferred cost for purchase of the eco friendly printed products. Profit is the most important factors for the marketing of the article. Table 1 depicts the cost price of the eco friendly printed products. The cost price of stole, duppatta and bed sheet found to be highest 280 rupees including cost of colors, raw materials and accessories, labour cost. Whereas of table mates it is Rs. 190 and Rs. 130 for table cover.

Table 1: Estimation of cost price of the eco friendly printed products

S. No.	Criteria of cost estimation	Articles												
		Stole	Wall piece	Table cover	Table mates	Scarf	Duppatta	Bed sheet	Purse	Sari border	Neckerchief	Tie	Magzine holder	Letter holder
1.	Cost of Colors (Rs.)	30	10	20	20	10	30	30	10	15	10	15	10	10
2.	Cost of raw materials (Rs.)	100	130	60	120	60	100	180	40	80	100	250	25	40
3.	Labor charge (Rs.)	150	20	50	50	15	150	75	40	50	10	15	25	20
4.	Total cost (Rs.)	280	160	130	190	85	280	285	90	145	120	280	60	70

The labour cost was decided according to the minimum wages paid in India to a skilled worker i.e. Rs. 350 per day. The cost for printed products was calculated according to time consumed in production of each product. Printing of products took 4-6 hours, Maximum time was consumed in printing of bed sheet, stole, and duppatta, while minimum time was consumed in printing of purse.

Evaluation for market potential: To assess the market potential of eco friendly printed products researcher estimated

cost price of the products. After this a rating scale was developed consisting of statements related to market potential of developed products. Parameters used to find out cost price of the developed products were cost of colors, cost of raw materials and accessories, labor charges and profit. For this purpose thirty women respondents and thirty market personnel dealing with sale of natural dyed products were contacted and their willingness to participate in the study was asked to rate the developed eco friendly printed products.

Table 2: Profit gained by sale of Eco- friendly printed products n=60

S. No.	Profit%	Stole	Wall piece	Tea Table cover	Table mates	Scarf	Duppatta	Bed sheet	Purse	Sari border	Neckerchief	Tie	Magazine holder	Letter holder	Total	Percent
1.	20	05	10	14	35	24	18	09	25	28	38	16	26	04	252	32.30
2.	35	18	22	32	22	28	11	32	30	24	18	20	18	15	290	37.17
3.	50	37	28	14	03	08	31	19	05	08	04	24	16	41	238	30.51

Finding of table 2 shows that 32.30 per cent respondents gave preference to 20 per cent profit whereas 37.17 per cent respondents were ready to give 35 per cent profit and 30.51 per cent respondents were willing for 50 per cent profit for the

eco friendly printed products. The result reveals that all eco friendly printed products have good market potential. All block and screen printed products were highly appreciated for their design arrangement, neatness, usefulness and eco-

friendliness.

Sujata (2009) ^[4] developed value added articles under investigation on “Renaissance of quilt (kaudi) making and value addition”. Cost of production of patchwork quilt value added products ranged between Rs. 52.86 to Rs. 176.90 and proved to be suitable technology for artisans to earn better profits.

Kumawat (2010) ^[2] in value addition to khadi bed linen and assessment of its market potential developed value added khadi bed linen using machine embroidery. Cost of articles ranged between Rs. 1180 to Rs. 1270. Findings reveals that 60 per cent respondents were willing to give 40 per cent profit and only 40 per cent respondents were willing to give more than 70 per cent profit. These types of bed linens have enough market potential. This is apparent that developed bed linens were highly acceptable and had good market potential.

Babel and Yadav (2011) ^[1] conducted a study on market potential of value added Kota doria saris. The objectives were to developed value added sari designs and to assess the cost and its market potential. They developed twenty sari designs using brass block printing and machine embroidery on Kota doria saris. Cost of the saris ranged between Rs. 825-925. 40 per cent respondents gave preferences to 20 per cent profit and minimum respondents i.e. 6 per cent gave preference to more than 40 per cent profit. The study result revealed that developed designs were highly appreciable and profitable.

The results are in conformity with Lodha (2013) ^[3] developed value added articles using niwar and assessed them for market potential, net rate was calculated and profit was added- 20 per cent, 30 per cent, 40 per cent and 55 per cent of the respondents gave preference to the 20 per cent profit and rest were agreed for 30 and 40 per cent profit. Products had high market potential and had good potential to start small scale enterprise.

Upadhayay, and Babel, (2013) ^[5] adapted traditional designs from Aipan (floor painting) of Kumaon on Kurties using Textile designing software. Developed designs were printed on kurties through block printing with tamarind seed powder as a thickening agent. The finding of the study reveals that the developed eco friendly block printed kurties were innovative, creative have enough market potential and were highly appreciated by the respondents.

Conclusion

In the present study eco friendly printed fabric is created from resources that are environmental friendly and sustainable, which will help to full fill demand of consumers demanding the green clothing and eco friendly apparel. It can be concluded that developed eco friendly printed products were highly appreciated by all the respondents. Cost of all products ranged between Rs. 60 to Rs. 285. Market potential results revealed developed eco friendly printed products had good market potential as the majority of the respondents were willing to purchase products. By developing eco friendly printed fabric one can start a small scale enterprise. Further this will also be helpful in reducing environment pollution in a fruitful manner.

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