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Tessu gulal: A livelihood option for tribal farm women of Shahdol district

¹Alpana Sharma, ²SK Singh, ³Alka Singh and ⁴Neelu Vishwakarma

¹Scientist JNKVV KVK, Shahdol, Madhya Pradesh, India

²Scientist JNKVV KVK, Tikamgarh, Madhya Pradesh, India

³Scientist JNKVV KVK, Sidhi, Madhya Pradesh, India

⁴Scientist JNKVV KVK, Jabalpur, Madhya Pradesh, India

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Corresponding Author: Alpana Sharma

Abstract

Tribal Shahdol District of Madhya Pradesh has wide coverage of forest natural resource i.e. 227698 ha (41% of total geographical area). Shahdol with its wide availability of tessu flowers (*Butea monosperma* flower) from forest in the months of February to April has options for development of herbal gulal. Seeing the huge scope to utilize this untapped tessu flowers (*Butea monosperma* flower) forest resource for the production of eco-friendly herbal gulal with meager or low input cost seems to be one of the best options as seasonal livelihood for the farm women. Thus KVK Shahdol intervene the work of production of eco-friendly herbal gulal. Also, knowing the huge occasional demand of gulal in festive season there seems an already existed local hat or market for the product.

On the other hand synthetic gulal, used by masses contains heavy metals, sand and soil and can cause ill effect on skin and health. The tessu gulal being skin friendly, thus is an innovative intervention undertaken by KVK Shahdol to enhance the income of farm women. Sixty farm women were selected and trained for preparation of gulal in two of the villages- Amraha (Block- Sohagpur) and Madva (Block- Burhar). For the preparation of gulal, base material tapioca powder and simple sieves of different mesh size was required. Tessu collected from forest is sorted, separated from pollen and shade dried at home for six days to prepare dried flowers. For the preparation of tessu gulal dye extractant is mixed at different conc. to tapioca powder. The natural colour extractant obtained from filtering is then mixed tapioca powder by continuous mixing with hand followed by sieving and drying of product in shade. The wet mixture is laid on clean mat for drying. The efficiency of production was 5 Kg per day by a single farm woman. The cost of production of 5 Kg of tessu gulal was Rs 940 (including labour cost) with a gross income of Rs. 3000. The B: C ratio comes to be 3.19. Thus, the above seasonal livelihood option seems to enhance the income of farm women considerably.

Keywords: Holi, arrowroot powder, eco-friendly, colourant and extractant

Introduction

Despite the current increase in demand for herbal "holi" powder, synthetic dye-based "holi" powder is more widely available on the market since it is made from a less expensive raw material and is simpler to prepare. The yearly growth rate for the sale of "holi" powder is still between 10% and 15% (Rawat, 2008)^[1].

The "holi" powder, which is made of synthetic dyes, can trigger allergies, rashes, and respiratory issues. Long-term use may possibly result in cancer. The majority of those artificial "holi" powders made from soil and sand are bad for skin. The majority of "holi" coloring ingredients are synthetic colors made from non-food materials like leather, paper, and textiles. Heavy metals are present in most of the "holi" powder made with artificial dyes. Empirical investigations have confirmed that these may result in skin abrasions, irritation of the skin and eyes, allergies, and even asthma attacks (Rawat, 2008, Sharma and Saxena, 2013 and Sharma, 2013)^[1, 2, 3].

Jain *et al.* (2015)^[7] reported that these artificial dyes used for Holi are likely to cause negative effects on the skin,

including the mucosa of the mouth and conjunctivitis. Das *et al.* (2015)^[8] reported that synthetic Holi powder includes sand, soil, and heavy metals, is utilized annually during the Holi festival which can do harm to the environment and to people's health, Thus a straightforward, inexpensive process for producing environmentally safe Holi powder needs to be established. Gupta *et al.* (2015)^[6], a plethora of skin illnesses are frequently caused by the widespread socio-religious and cultural practices in the Asian subcontinent, which dermatologists may overlook due to a lack of awareness. Bhatnagar *et al.* (2018)^[5] conducted research at a north Indian tertiary regarding the harmful Holi colours and its potentially harmful effects on the eyes.

Tribal Shahdol District of Madhya Pradesh has wide coverage of forest natural resource i.e. 227698 ha (41% of total geographical area). KVK Shahdol planned to utilize untapped resource (Tessu flower – *Butea monosperma* flower) from forest for preparation of herbal gulal. Shahdol with its wide availability of tessu flowers from forest in the months of February to April has options for development of herbal gulal. Seeing the huge scope to utilize this forest

resource for the production of eco-friendly herbal gual with meager or low input cost seems to be one of the best options as seasonal livelihood for the farm women. Also, knowing the huge occasional demand of gual in festive season there seems an already existed local hat or market for the product.

Materials and Method

Women of village Amraha (Block- Sohagpur) and Village-Madwa (Block- Burhar) of Shahdol district were selected and trained for making tessu gual using dye extractant from tessu flowers. The tessu flower used in extraction of natural dye are collected from forest cover around the village. The instruments used in preparation of herbal gual such as gas stove, weighing machine, steel container, local stoves were

made available at village levels.

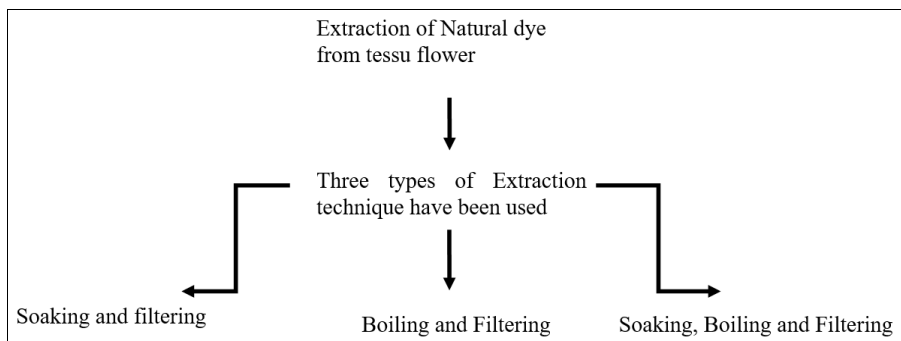
Different methods of extraction of natural dye

There are two types of techniques used for extraction of natural dye from tessu leaves.

- Soaking technique
- Boiling technique

Table 1: Different type of extraction used for herbal gual preparation was as follows

Dye Extraction	Represented by
Dye extracted by soaking in water	S1
Dye extracted by Boiling water	S2
Dye extracted by soaking + Boiling	S3



Flow Sheet 1: Extraction of natural dye for herbal gual

Dye Extraction Technique

Firstly 10 kg fresh flowers of tessu were soaked overnight in water. Further the dye was extracted by filtering the extract. In second preparation process the dye was extracted by boiling water and filtering the extract. In the third preparation the dye was extracted by soaking overnight followed by boiling treatment. A more strong dye extract was prepared by Soaking, Boiling and Filtering process.

Preparation of herbal gual

Preparation of herbal gual by using tapioca flour. The freshly collected extract was mixed with tapioca flour by hand in the ratio of 70: 30 (flour: extract). The flour dye extract mix was then finally sieved and dried. Then dry it for 24 hours in sun. After drying grind it in a powder form. Finally we obtained herbal gual by using tapoica flour. Four distinct type of gual were made. Four distinct shades of gual were evaluated for color brightness, texture and acceptability as herbal gual based only on appearance. The herbal gual containing dye extract was evaluated. The herbal gual was kept in airtight storage, on average room temperature and in the dark for six months. Following

production and six months of storage, these gual were evaluated for their sensory attributes, with a focus on color brightness, texture, stickiness of the powder to skin, and general acceptability using a nine-point Hedonic scale.

Results and Discussion

Table. 1 showed the acceptability and preference of Herbal Gual at different dye conc. ranging from 2.5% to 10% dye concentration. It was found that Herbal Gual with dye contents of 5%, 7.5%, and 10% was more acceptable and preferred by consumer due to its color brightness. There was good acceptance of texture for all four different powders. Also the storability of herbal gual at room temperature at dark in closed plastic containers in terms of quality of the color shows no difference in colour in six months. The research conducted by Srivastava and Kumar (2003), focussed on the satisfaction of consumers regarding the level of brightness found in the 'holi' powder. The dye was mixed at a higher concentration of 10%. Nevertheless, FPO limits the presence of heavy metals in approved colours to safeguard human health and the environment.

Table 2: Acceptability and Preference of Herbal Gual at different dye conc

Different Dye Conc.	Colour Brightness	Texture	Over acceptability	Preference
2.5%	Light	Good	Very Low	Not preferred
5%	Medium	Good	Low	Not preferred
7.5%	Good	Good	Medium	Preferred
10%	Very good	Good	Good	Good Demand

Table. 2 showed the cost economics of herbal gual. The total cost of production including tessu flower, tapioca flour and labour cost comes to be Rs 940 per 5 Kg herbal gual.

Further the Gross return and net return was Rs 3000 and Rs 2060 per 5 Kg herbal gual. The intervention of production of herbal gual show a promising B: C ratio of 3.19.

Table 3: Cost economics of herbal gulal (Per 5Kg production)

Particulars	Herbal gulal
Total Cost of Input (Tessu flower, turmeric powder, tapioca flour and labour cost) (Rs/5 kg)	940
Gross return (Rs./ unit)	3000
Net return (Rs/Kg)	2060
Cost benefit ratio	3.19

From the present study, it has been observed that tapioca flour can be used as base material for herbal gulal making, instead of other chemical used in commercial products as been safe, skin friendly for consumers. Also tapioca is a low agronomic input requiring crop, it can be a better substitute for costly starch extracted from corn or other cereals, which are presently used in some costly herbal gulal.

Conclusion

In Conclusion, the study demonstrated the acceptability and preference of Herbal Gulal across various dye concentrations, with 5%, 7.5%, and 10% concentrations proving more favorable due to their brightness. Texture across all variants was well-received, with six months of storage showing no deterioration in color quality. Despite the higher 10% dye concentration, compliance with FPO standards for heavy metal content is crucial for consumer safety and environmental protection. Moreover, the cost analysis revealed promising returns, with a favorable B: C ratio of 3.19. Utilizing tapioca flour as a base material not only ensures safety and skin-friendliness but also offers an economically viable alternative to traditional starch sources. This study paves the way for the sustainable production of Herbal Gulal, catering to consumer preferences while prioritizing environmental and economic considerations.

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