

Formulation and Evaluation of Herbal Hair Dye

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Abstract:- Loss of colour in hair is because of shifted reasons like hereditary impact, impact of ecological variables, utilization of alcoholic arrangements, and so forth. However, the long-lasting engineered hair colours are accessible in various variety goes and hold normal radiance, they have the main detriment of creating easily affected responses in certain people. In the current examination different blends of powdered leaves and hair care plants like Henna, Indigo, Bhringraj, Amla, Shikakai, Gulvel, Brahmi, Jatamansi and Shatavari were assessed for their shading and awareness responses. Henna and Indigo detailing was viewed as reasonable normal colorant.

The current examination, endeavours were made to make a powder home grown hair colour that gives rosy earthy coloured tone to hair, looking like normal Hair tone with better colouring impact and more prominent maintenance limit on correlation with showcased natural hair colour plan. Most of the showcased Herbal hair colour definitions contain para-phenylenediamine at 20-25% fixations which is the primary element of business engineered colours. Setting off unfavourably susceptible skin responses in many people is known. Ayurvedic powder hair colour absent any trace of any engineered specialist was ready in present examination Work and assessed for colouring productivity.

Keywords:- Natural Hair Colorants, Dye Yielding Plants, Hair Care Plants, Henna, Indigo.

I. INTRODUCTION

From old days different materials from plants like Henna, Chamomile, Indigo, and so forth are utilized to colour the silver hair to get regular dark colour yet rather than getting dark colour individuals get red to copper colour. Loss of variety in hair is because of fluctuated reasons like hereditary impact, impact of natural variables, utilization of alcoholic arrangements, and so forth. However long-lasting engineered hair colours are accessible in changed variety and reaches hold regular brilliance, they have the main burden of creating overly sensitive responses in certain people. Some hair colours showcased as regular colour, contain 13% of phenylenediamine which is an engineered hair colour and mess the skin and garments during use. A need was felt to form an item containing just plant items. which is ok for use and does not have the issues of staining skin during use and easily affected responses. In the current examination the details are created to get normal dark variety utilizing mix of various plant materials. This examination was arranged in

view of encounters of a few groups who were involving different plant items for shading their hair without having any issues of irritancy, sensitivity, or responsiveness. The main aim of the present investigation is to formulate natural and safe hair colorants.

II. ROLE OF INGREDIENTS USED IN THE FORMULATION OF HERBAL HAIR DYE

A. Henna

Henna likewise lessens untimely turning grey of hair, since it is stacked with tannins, a plant compound found in a tea that adds to their rich shading. Henna contains vitamin E, which assists with mellowing hair. The natural leaves of the plant are rich in proteins and antioxidants that support hair health.



Fig 1: - Henna powder

B. Amla

Amla powder upgrades the retention of calcium, assisting with making better bones, teeth, nails, and hair. It keeps up with the hair tone and forestalls untimely turning gray, reinforces the hair follicles. Amla is the most extravagant and concentrated type of Vitamin C alongside tannins found among the plants. The Vitamin C found in the natural product predicaments with tannins that safeguard it from being lost by intensity or light. This amla powder is additionally plentiful in tannins, minerals like Calcium, Phosphorus, Fe and amino corrosive. The natural product extricate is valuable for hair development and decrease balding. Amla has antibacterial and cell reinforcement properties that can assist with advancing the development of solid and shiny hair.

**Fig 2: Amla Powder****Fig 4: Shikakai Powder****C. Reetha**

Reetha is plentiful in vitamin A, D, E, K, saponin, sugars, unsaturated fats and adhesive. Reetha removes helpful for the advancement of hair development and decreased dandruff. Concentrate of organic product coat goes about as a characteristic cleanser, consequently is utilized in home grown shampoos as hair chemical Reetha as soapnuts or washing nuts, assume a significant part as normal hair care items since more established times. This plant is improved with saponins, which makes the hair solid, gleaming, and glossy when utilized on customary premise.

**Fig 3: Reetha Powder****D. Shikakai**

Shikakai is an astonishing spice that is ordinarily tracked down in the tropical woods of India. Shikakai is a strong normal home grown plant that keeps on being utilized by age to age. Shikakai otherwise called "Acacia Concinna" for a long time presently, has been utilized as hair care fixing to clean their hair and reason is its various natural properties. Shikakai is otherwise called the hair natural product as it gives various supplements to the hair and speeds up development. Shikakai contains high purifying properties, in this manner it works best as a cleanser substitution. Shikakai is plentiful in cell reinforcements and nutrients like A, C, and K which makes a difference in keeping the hair healthy and shiny.

E. Tea powder

Being rich in polyphenols, selenium, copper, phytoestrogens, melatonin, tea also has been used in traditional Chinese medicine and in Ayurvedic medicine has been used since long as hair colourant

**Fig 5 :Tea Powder****F. Hibiscus**

It is magnificent for expansion in hair development movement. Hibiscus is normally enhanced with Calcium, Phosphorus, Iron, Vitamin B1, Vitamin C, Riboflavin and Niacin, which help to advance thicker hair development and diminishes untimely turning gray of hair. This blossom is utilized for controlling dandruff Hibiscus displays cancer prevention agent properties by delivering flavonoids, for example, anthocyanins and other phenolic compounds. Restoring the hair by molding it can be utilize.

**Fig 6: Hibiscus Powder**

G. Jatamansi

Jatamansi roots are converted into a paste and applied on the scalp to promote hair growth. Extracted jatamansi hair oil reduces hair fall and increases hair growth also reduces bald patches. The jatamansi hair oils also impart blackness to the hair and are also used as a natural dye. Jatamansi is an important drug of ayurveda and is used in different traditional system of medicine such as ayurveda, unani, siddha etc. Its rhizomes and roots are used as tranquilizer, laxative, cardiac tonic, nervous headache, low and high blood pressure.

**Fig 7: Jatamansi Powder****H. Indigo powder**

Indigo powder conditions and feeds the foundations of the hair and makes each strand of hair more grounded. Indigo powder forestalls scalp disease and utilizing it with coconut oil advances the scalp with every one of the supplements and makes hair more grounded and better.

**Fig 8: Indigo Powder****I. Brahmi:**

Normal use of Brahmi reinforces your hair roots and keeps them very much sustained. This spice is stacked with supplements that can help your hair. Because of its biochemical organization, it is successful in treating brief balding.

Brahmi has cell reinforcement properties that guarantee the scalp is kept clean. Adding Brahmi into your cleaning agent can guarantee you have a solid scalp that is liberated from any aggravations.

**Fig 9: Brahmi Powder****J. Lavender oil:**

Lavender oil has been found to invigorate hair development and give a thicker hair than expected. As per studies, lavender oil is known to upgrade conditions like example hair sparseness or alopecia. Lavender oil is antimicrobial and doesn't permit microorganisms or parasites to develop. At the point when lavender oil is applied to the scalp, it can help in the treatment of microbial diseases. It very well may be utilized to treat bothersome scalp, dandruff and furthermore further develop contaminations.

**Fig 10: Lavender Oil****K. Rosemary**

Rosemary is extremely normal and effectively open spice. It is green in appearance with meager, needle-like leaves with a profound, sharp smell. With regards to its commitments to hair it is by all accounts generally useful. Here is a short rundown of its purposes and advantages to hair.

Hair Growth - Stimulates and improves circulation to the scalp thus encouraging hair growth.

Hair Cleanser - Due to its antibacterial quality it gently cleanses hair.

Shine - Increases shine.

Scalp issues - Relieves irritated, dry, flaky, dandruff ridden scalps.



Fig 11: Rosemary

III. MATERIALS AND METHODS

➤ MATERIALS

Sr. no	Ingredients	Quantity
1	Henna	25gm
2	Amla	5gm
3	Reetha	2gm
4	Shikakai	2gm
5	Bhrinjraj	2gm
6	Tea powder	2gm
7	Rosemary	2gm
8	Gulvel	2gm
9	Brahmi	2gm
10	Jatamansi	2gm
11	Lavender oil	5 drops
12	Peppermint	1gm
13	Hibiscus powder	2gm
14	Indigo powder	2gm

Table 1: The composition of formulation is reflected in the following table.

➤ Methods

For the preparation of herbal hair dye, we have selected different herbal ingredients such as Henna, Reetha, Amal, Shikakai, Bhrinjraj, Tea powder, Lavender oil, Rosemary, Gulvel, Indigo powder, Brahmi, Jatamansi, Pepper mint, Hibiscus powder etc.

1. This all ingredients were collected from the authorized stores of the local market in the powdered form.
2. The all the ingredients was weighed and passed through Sieve no. 24.
3. Then all ingredients were mixed uniformly to prepare homogenous mixture of a powder form of dye.
4. The homogenous mixture was weighed and packed in a plastic bag.

IV. COMPARISON BETWEEN MARKETED HERBAL DYE AND FORMULATED FORMULATION



Marketed herbal hair dye formulations only contains a traditional ingredient which is use for hair growth like **indigo, henna, amla, Bhringraj, Brahmi, neem, shikakai**. These traditional ingredients are only having effect on hair growth and they only provide a colour to the grey hairs.

In the newly prepared herbal hair dye preparation, we used additional ingredients like **Reetha, Tea powder, rosemary, Gulvel, Jatamansi, lavender oil, hibiscus powder** etc. these all ingredients are helpful for hair growth, promote health of hairs and scalp, reduce hair fall and nourishes hairs along with the attractive hair colour.

V. EVALUATION OF THE HERBAL HAIR DYE

A. Organoleptic evaluation of hair dye:

1. Colour of formulation
2. Odour of Formulation
3. Appearance
4. Texture

B. Physio - chemical evaluation:

The physical and chemical features of the herbal hair dye were evaluated to determine the pH, its moisture content for the purpose of stability, compatibility and the amount of inorganic matter present in it.

C. Phytochemical evaluation:

a. Molisch's test

- Take 1 gm of sample in dry test tube
- Take 2 ml of distilled water in a sample
- Add 2 to 3 drops of Molisch's reagent to solution
- Observe colour change at junction of two layers

b. Volatile oil test:

- Sample + alcoholic solution of Sudan III
- Observe the colour

c. Mayer's test (For alkaloid):

- Sample + Mayer's reagent
- Observe the colour

d) Rheological evaluation:

➤ *Bulk Density:*

- Weigh accurately 5gm of powdered dye and transfer in 100ml of measuring cylinder. Carefully level the powder blend without compacting, and read the unsettled apparent value.
- Bulk density= Bulk mass/Bulk volume

➤ *Tapped Density:*

- Weigh accurately 5gm of powder dye and transfer in 100ml measuring cylinder.
- Then precisely tap the chamber containing the example by raising the chamber and permitting it to drop under its own weight utilizing mechanical tapped thickness analyzer at ostensible pace of 300 drops each moment.
- Tapped Density = Mass/Tapped volume

➤ *% Carr's index=*

$(\text{Tapped density} - \text{Bulk density}) / \text{tapped density} * 100$

➤ *Housner's Ratio =*

$\text{Tapped density} / \text{Bulk density}$

➤ *Patch test:*

This normally include spotting the limited quantity of watery arrangement of hair color behind the ear on or internal elbow in a space 1sq.cm and passing on it to dry. The indication of disturbance or feeling of non-health is noted, if any. Estimated and little amounts of the pre-arranged hair

pack were applied to the region for the proper time. Irritancy, redness, and enlarging were checked and notice for standard stretch as long as 24 hours if any.

➤ *Stability test:*

Solidness testing for the pre-arranged plan was performed by putting away at various temperature condition for the hour of time of one month. The pressed glass vials of definition were put away at various temperature condition for the actual boundaries like tone, smell, pH, surface and smoothen.

VI. APPLICATION OF HAIR DYE

The pack, which is as powder, ought to be utilized week after week on wet hair, shaping a glue of in water with ideal consistency. It ought to be applied uniformly on the hair with the assistance of a brush, covering the roots to the hair tip The scalp ought to be covered. It should be left for 2-3 hours on the scalp for complete drying. Then it should be removed by washing with plain water.

VII. RESULT AND DISCUSSION

A. Organoleptic evaluation:

Sr. No.	Parameters	Observations
1	Colour	Green
2	Odour	Characteristics
3	Texture	Fine
4	Appearance	Powder

Table 2: Organoleptic evaluation

Sr. No.	Parameter	Results
1.	PH	6.5
2.	L. O. D.	1.7%

Table 3: Physico-chemical evaluation of herbal hair dye

B. Phytochemical Evaluation:

a. Molisch's Test

Appearance of purple colour indicates the presence of carbohydrates.



Fig 12: Molisch's Test

b. Volatile Oil Test

It gives red colour Indicates Volatile oils are present.



Fig 13: Volatile Oil Test

c. Mayer’s Test

It gives yellow precipitation, indicates alkaloids are present.



Fig 14: Mayer’s test

C. Phytochemical Evaluation

Sr. No.	Parameter	Result
a	Molisch’s Test	Carbohydrates Present
b	Volatile Oil Test	Volatile oils Present
c	Mayer’s Test	Alkaloids Present

Table 4: Summary of Phytochemical evaluation

a) Rheological evaluation:

Sr no.	Parameters	Results
1	Bulk density	0.33
2	Tapped density	0.5
3	Angle of repose	1.03
4	% Carr’s index	34% (Poor Flow)
5	Houseners ratio	1.5 (Poor Flow)

Table 5: Rheological evaluation of herbal hair dye

b) Patch test:

S. No.	Parameters	Results
1.	Swelling	Negative
2.	Redness	Negative
3.	Irritation	Negative

Table 6 :Patch Test of Herbal hair dye

c) Stability testing:

S. No.	Parameters	Room Temperature	35°C
1.	Colour	No change	No change
2.	Odor	No change	No change
3.	pH	6.5	6.7
4.	Texture	Fine	Fine
5.	Smoothness	Smooth	Smooth

Table7: Stability Testing of Herbal Hair Dye

VIII. CONCLUSION

A home-grown hair pack colors the hair in a most extreme delicate way. The upsides of home-grown based beauty care products are their nontoxic nature. It nitrifies the skin of the scalp and hair. This hair detailing gives indispensable sustenance to the skin. It assists with treating dandruff by expulsion of abundance oil from scalp. Successive utilization of this pack prompts reasonable, frizz free shaded hair. Contamination, maturing, stress and brutal environments seriously influence the nature of hair. In this exploration, we found powerful properties of the home-grown hair pack and further examinations are required to have been performed to investigate more helpful advantages of this natural hair pack Natural cures are generally acknowledged with open hands these days as they are more secure with negligible secondary effects when contrasted with the synthetic based items. Home grown plans are extremely popular to satisfy the temperaments of the developing scene market. It is an observable endeavour to figure out the natural hair pack containing the decency of powders of various plants, which are incredible for hair care.

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