



International Journal of Research in Pharmacology & Pharmacotherapeutics (IJRPP)

IJRPP | Vol.14 | Issue 3 | Jul - Sept -2025

www.ijrpp.com

ISSN: 2278-2648

DOI : <https://doi.org/10.61096/ijrpp.v14.iss3.2025.277-286>

Research

Formulation and Evaluation of Polyherbal Hair Dye

M. Sai Nikitha¹, M. Veena¹, M. Sneha¹, M. Sai Sreeya¹, M. Durga Prerana¹, D. Sunitha^{2*},
M. Sudhakar³.



¹Student, Malla Reddy, College of Pharmacy, Dhulapally, Secunderabad, Telangana, 500100

²Professor, Malla Reddy College of Pharmacy, Dhulapally, Secunderabad, Telangana, 500100

³Principal, Malla Reddy College of Pharmacy, Dhulapally, Secunderabad, Telangana, 500100

*Author for Correspondence: Dr D Sunitha

Email: basasunitha@gmail.com

	Abstract
Published on: 13 July 2025	<p>A dye can typically be defined as a colored Substance that has an affinity to the fiber, fur or hair. Continuous utilization of such compounds containing dye on herbal hair reasons such a lot of aspect effects along with pores and skin inflammation, erythema, loss or damage of hair and skin most cancers. In oxidation device, there's a severe diffusion of the molecule into the cortex, what promotes an extended shade resistance. Herbal preparations viz., herbal pills, herbal tonics, herbal paste, natural shampoo, natural contraceptives and herbal dyes has become popular most of the customer herbal drug treatments represent the quickest developing section to heal the various illnesses. Hair dyes encompass dyes modifiers, antioxidants, alkalizes, soaps, ammonia, wetting sellers, fragrance, and a ramification of different chemical substances used in small amounts that impart unique qualities to hair along with softening the texture or supply a desired movement to the dye.</p>
Published by: Futuristic Publications	
2025 All rights reserved.  Creative Commons Attribution 4.0 International License.	
	<p>Keywords: Herbal hair dye, benefits, natural ingredients, henna, amla, coffee, tea, indica</p>

INTRODUCTION

Hair coloring or dying are methods of altering the color of one's hair. The main motivation for this is to recolor grey and white hair or to bring back the original color of hair that has been discolored by sun exposure or cosmetics. Herbal dyes have all of the benefits of natural substances. These formulations, in addition to working as a hair color, function as a hair growth stimulant and nourishment due to the right amalgamation of herbs. In recent years, the beauty industry has witnessed a notable shift towards natural and sustainable products, driven by consumer demand for safer alternatives to conventional cosmetics¹. Within this landscape, herbal hair dyes have emerged as a compelling option for individuals seeking to enhance their hair color without compromising on health or environmental impact. Unlike traditional hair dyes laden with synthetic chemicals, herbal hair dyes harness the power of botanical ingredients to achieve vibrant and long-lasting results². This introduction sets out

to explore the rising popularity of herbal hair dyes, highlighting their composition, efficacy, and potential advantages over their synthetic counterparts. Herbal hair dyes, often formulated with plant-derived substances like henna, indigo, and amla, offer a diverse spectrum of colors while boasting gentle, nourishing properties for the hair and scalp³⁻⁴.

Benefits of herbal hair dyes⁵

1. **Natural ingredients:** Herbal hair dyes are formulated with botanical extracts, such as henna, indigo, and amla, which are gentle on the hair and scalp compared to synthetic chemicals found in traditional dyes.
2. **Reduced allergic reactions:** Herbal hair dyes are less likely to cause allergic reactions or scalp irritation due to their hypoallergenic nature, making them suitable for individuals with sensitive skin or allergies.
3. **Nourishing properties:** Many botanical ingredients used in herbal hair dyes, such as henna and amla, contain natural conditioning agents that help nourish and strengthen the hair, leaving it soft, shiny, and more resilient.
4. **Long-lasting color:** While herbal hair dyes may require more frequent application compared to synthetic dyes, they often provide long-lasting color that gradually fades without harsh lines or roots.

Advantages

- Herbal appearance of use of real human hair fiber.
- Can be styled as a natural hair.
- Capable of coloration and perm.
- Movements like natural hair.
- Much less susceptible to warmth harm.

Disadvantages

- More steeply-priced.
- Want extra protection and care.
- Requires styling.
- Can be heavier in weight after applying, which may cause itching.
- Greater vulnerable to daylight fading and environmental harm.

Types of hair colors⁶⁻⁷

There are four most common hair color classifications

- (i) **Temporary hair dyes:** Temporary hair color is available in a variety of forms including rinses, shampoos, gels, sprays and mousses. Temporary hair colors are typically brighter and more vibrant than semi-permanent and permanent. The pigment molecules in temporary hair colors are large and cannot penetrate the cuticle layer. The remaining color particles are absorbed into the hair shaft and are easily removed with a single shampoo. It takes approximately a few hours to a day.
- (ii) **Semi-permanent hair dye:** Semi-permanent hair color has a smaller molecular size than temporary dyes and is therefore able to partially penetrate the hair shaft. This is why hair color can last 4-6 shampoos or several weeks. Semi-permanents contain no or very low levels of developer, peroxide or ammonia. However, it may contain a toxic compound such as P-phenylenediamine or other agents.
- (iii) **Demi-permanent hair dyes:** Demi-permanent hair dyes are permanent hair dyes that contain an alkaline agent other than ammonia (e.g. ethanolamine, sodium carbonate) and when always used with a developer, the concentration of hydrogen peroxide in this developer may be lower than in permanent hair dye.
- (iv) **Permanent hair color:** All permanent hair dyes and lighteners contain a developer or oxidizing agent and an alkalizing agent (most commonly ammonia). When a dye containing an alkalizing agent is mixed with a developer, a chemical reaction occurs that swells the hair, allowing the dye to enter the cortex where the melanin resides. Ammonia swells the hair cuticle to allow color pigments to penetrate deep into the hair shaft. Permanent colors are truly permanent and do not wash out, although they may fade.

MATERIALS AND METHODOLOGY:

Introduction of Herbal Ingredients⁸⁻¹⁵

Henna

Biological Source: Henna consist of fresh or dried leaves of the plant *Lawsonia inermis*.

Chemical Constituents: Lawsone is the active constituents of Henna leaves. The other chemical constituents of henna are gallic acid, white resin, sugars, tannins and xanthones.

Henna, a natural dye derived from the leaves of the *Lawsonia inermis* plant, plays a pivotal role in herbal hair dye formulations. Renowned for its vibrant reddish-orange hue, henna is a staple ingredient in herbal hair dyes, offering a natural and gentle alternative to synthetic colorants. In herbal hair dye formulations, henna serves not

only as a coloring agent but also as a conditioner and scalp treatment. Its dyeing properties penetrate the hair shaft, imparting rich, long-lasting color while simultaneously strengthening and nourishing the hair.

Use: Henna balances the pH of the scalp preventing premature hair fall and graying of hair.



Henna

Amla

Indigo

Amla

Biological source: It consists of dried as well as fresh fruits of the plant *Embelica officinalis* Gaertn.

Chemical Constituents: Amla fruits contain high amounts of ascorbic acid (Vit C), and have a bitter taste that may derive from a high density of ellagitannins, such as emblicanin A, emblicanin B, punigluconin, and pedunculagin. It also contains punicafofin and phyllanemblinin A, phyllanemblin other polyphenols, such as flavonoids, kaempferol, ellagic acid, and gallic acid.

Uses: Amla has antibacterial and antioxidant properties that could assist promote the increase of wholesome and lustrous hair. It maintains the hair color and stops untimely graying, strengthens the hair follicles.

Indigo

Biological source: It is obtained from legume and leaves of *Indigofera tinctoria*.

Chemical Constituents: It primarily contains the compounds indigotine, it also contains other compounds like indirubin and rotenoids

Indigo, a natural dye derived from the leaves of the *Indigofera tinctoria* plant, is commonly used in herbal hair dyes for its rich blue-black color. When used in hair dyes, indigo can impart deep, cool-toned hues to the hair, ranging from dark browns to intense blacks. Indigo works by binding to the protein in the hair shaft, resulting in long-lasting color that gradually fades over time. Often used in combination with henna, another natural dye, indigo can help achieve a broader spectrum of colors, including shades of brown and burgundy.

Uses: Indigo is mostly used as a source of dye. It has been evaluated for treatment of psoriasis and other dermatological conditions as well as GI diseases such as ulcerative colitis. However, clinical information is lacking to recommend use for any indication.

Reetha

Biological Source: It is obtained from fruit of *Sapindus mukorossi*

Chemical Constituents: The major constituents present in Reetha are saponins, sugars and mucilage. The seed kernels of Reetha are a rich source of proteins and show a balanced amino acid composition as per the World Health Organization. In addition to proteins, sugars and fibres are also present. Its fruit is rich in vitamin A, D, E, K, saponin, sugars, fatty acids and mucilage.

Uses: Reetha extract is useful for the promotion of hair growth and reduced dandruff. This plant is enriched with saponins, which makes the hair healthy, shiny, and lustrous when used on regular basis.



Reetha

Shikakai

Bringaraj

Shikakai

Biological source: It is obtained from dried pods of *Acacia concinna*.

Chemical Constituents: In commercial extracts, when the plant is hydrolyzed it yields spinasterol, acacic acid, lactone, and the natural sugars glucose, arabinose and rhamnose. It also contains hexacosanol, spinasterone, oxalic acid, tartaric acid, citric acid, succinic acid, ascorbic acid, and the alkaloids calyctomine and nicotine.

Uses:

- The extract obtained from its pods is used as a hair cleanser and for the control of dandruff. Shikakai or acacia concinna, has rich amount of vitamin C, which is beneficial for hair
- Shikakai naturally lowers the pH value and retain the natural oils of the hair and keeps them lustrous and healthy.
- It is also effective in strengthening and conditioning hair, Amala, reetha and Shikakai compliments each other, therefore, they are mixed together to have healthy and lustrous hair.

Bhringraj

Biological source: It is obtained from the whole plant of *Eclipta alba*.

Chemical constituents: Eclipta prostrate contains phytochemicals such as coumestans, polypeptides, polyacetylenes, thiophene derivatives, steroids, sterols, triterpenes, and flavonoids. The plant carries the alkaloid ecliptine. Other chemical substances identified are wedelolactone, wedelic acid, apigenin, luteolin, b-amyirin and so forth.

Uses: It saves you from hair fall and untimely graying. It also stimulates hair growth. - Neelibhringaadi Tailam mentioned in Ayurveda is good for promoting hair growth and giving natural color to gray hair. Bhringraj is used in the preparation of various oils, shampoos, hair dyes.

Hibiscus

Biological source: It is obtained from the flower of *Hibiscus rosasinensis*.

Chemical constituents: The phytochemical analysis showed that hibiscus rosa-sinensis contained tannins, anthraquinones, quinines, phenols, flavanoides, alkaloids, terpenoids, saponins, cardiac glycosides, protein, free amino acids, carbohydrates, reducing sugars, mucilage, essential oils and steroids.

Uses: It is excellent for increase in hair growth activity. Hibiscus is naturally enriched with Calcium, Phosphorus, Iron, Vitamin B1, Vitamin C, Riboflavin and Niacin, which help to promote thicker hair growth and decreases premature graying of hair. This flower is used for controlling dandruff. Hibiscus exhibits antioxidant properties by producing flavonoids such as anthocyanins and other phenolic compounds. It can be used to rejuvenate the hair by conditioning it.



Hibiscus



Bhringraj



Coffee

Brahmi

Biological source: Brahmi is obtained from the dried leaves and stems of the plant Bacopa monnieri.

Chemical constituents: Ascorbic acid, nicotinic acid, Brahmine, Herpestine, Alanine, hentrin, acontane, Octacosane, Monnierin (saponin), Hersaponin, bacosid A & B, bacogenins A1-A4 (Sapogenins) B- Sitosterol, etc.

Uses: It is commonly used to treat Alzheimer's disease, memory and thinking skills, anxiety and attention deficit hyperactivity disorder. It may also have antidepressant, sedative, and cognitive effects on brain. Brahmi is a coolant herb. Milk is also naturally cold. Taking Brahmi with cold milk will increase the coldness in the body. This is ideal for Pitta body type people, who feel hot all the time. But for Kapha and Vata dominant persons, Brahmi with hot milk is more suited. The hotness of the hot milk slightly decreases the natural coldness of the milk.

Coffee

Biological source: It is the dried ripe seeds of *Coffea arabica* Linn, belonging to family Rubiaceae.

Chemical Constituents: The main constituents of coffee are caffeine, tannin, fixed oil and proteins. It contains 2–3% caffeine, 3–5% tannins, 13% proteins, 10–15% fixed oils. In the seeds, caffeine is present as a salt of chlorogenic acid. Also it contains oil and wax.

Uses: Coffee is widely used as a flavoring agent, as in ice cream, pastries, candies and liquors. Source of caffeine, dried ripe seeds are used as a stimulant, nervine and diuretic, acting on CNS, kidneys, heart and muscles. Very valuable in cases of snake-bite, helping to ward off the terrible coma. It also exerts a soothing action on the vascular system, preventing a too rapid wasting of the tissues of the body; these effects are not only due to the volatile oil but to the caffeine it contains.

Tea

Biological source: It contains the prepared leaves and leaf buds of *Thea sinensis* (Linne) kuntz., belonging to family Theaceae.

Chemical Constituents: The leaves are a rich source of caffeine (1–5%). It also contains theobromine and theophylline in minor quantities. The colour of tea leaves is due to tannin (10–20% gallotannic acid). The agreeable odour is due to presence of a yellow volatile oil. Tea leaves also contain protein, wax, resin and ash. 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 colorant. The tannins present in tea are known to increase the color intensity of hair.

Uses: It is used as stimulant, astringent and also as diuretic.



Tea



Beetroot



Aloe vera

Beetroot

Biological source: It is obtained from the plant *Beta vulgaris*.

Chemical constituents: It is particularly rich in betalains, betacyanins, betaxanthins. Additionally it contains nitrates, polyphenols, carotenoids, saponins, copper, iron, zinc.

Beetroots, commonly known as beets, are a vibrant and versatile type of vegetable. They're known for their earthy flavor and aroma. Many people call them a superfood because of their rich nutritional profile.

Uses:

- It is an antioxidant powerhouse.
- It is used to treat anaemia.
- It is good for cardiovascular and blood health.

Aloe vera

Biological source: Aloe is the dried juice collected by incision, from the bases of the leaves of various species of Aloe. *Aloe perryi* Baker, *Aloe vera* Linn or *Aloe barbadensis* Mil and *Aloe ferox* Miller, belonging to family Liliaceae.

Chemical Constituents: The most important constituents of Aloes are the three isomers of Aloins, Barbaloin, β -barboloin and Isobarbaloin, which constitute the so-called 'crystalline' Aloin, present in the drug at from 10 to 30%. Other constituents are amor-phous Aloin, resin, emodin and Aloe-emodin. Barbaloin is present in all the varieties; it is slightly yellow coloured, bitter, water soluble, crystalline glycoside.

Uses: Aloe Vera is effective for scalp and may be used no longer simplest to deal with hair loss, but to promote hair boom as properly. Aloe Vera consists of aloe emodin which promotes hair increase by stimulating hair follicles. It's also beneficial in treating the scalp from solar burn. It is used as a herbal mordant. It is also recognized for its emollient effect. The clear gel of the leaf makes an excellent treatment for wounds, burns and other skin disorders, placing a protective coat over the affected area, speeding up the rate of healing and reducing the risk of infection

Coconut oil

Biological source: It is extracted from the dried kernel or copra of the fruit specifically the species *Cocos nucifera* of family Arecaceae

Chemical Constituents: Coconut obtained from the hard, dried endocarp consists of a mixture of triglycerides of saturated fatty acids. The oil contains about 95% of saturated fatty acids with 8 and 10 carbon atoms. It shows the presence of caprylic acid, 2%; capric acid, 50–80%; lauric acid, 3%; and myristic acid about 1%.

Uses: Coconut oil is used as dietary products in many areas of the world. In European pharmacopoeia, fractionated coconut oil is known as 'Thin vegetable oil'. It is useful as a non aqueous medium for the oral administration of some medicaments. Fractionated coconut oil is used as a basis for the preparation of oral suspension of drugs unstable in aqueous media.



Coconut oil



Formulation -1

Procedure¹⁶⁻¹⁷**Formulation-1**

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

1. All ingredients were collected from the authorized stores of the local market in the powdered form.
2. Then all the ingredients were 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 homogeneous mixture was weighed and packed in a plastic bag.

S. No.	Ingredients	Quantity (gm)
1	Henna	35 gm
3	Reetha	15 gm
4	Shikakai	10 gm
5	Bhrinjraj	10 gm
6	Tea extract	5 ml
7	<i>Aloe vera</i>	20 gm
8	Coconut oil	5 drops
9	Hibiscus powder	12 gm
10	Indigo powder	20 gm

Formulation-2

S. No	Ingredients	Quantity (gm)
1.	Henna	40 gm
2.	Amla	30 gm
3.	Reetha	20 gm
4.	Shikakai	20 gm
5.	Hibiscus	20 gm
6.	Coffee	20 ml
7.	Beetroot	10 ml
8.	Bhringraj	20 gm
9.	Coconut oil	20 ml

For the preparation of herbal hair dye, we have selected nine important ingredients such as Henna, Reetha, Coffee, Shikakai, Amla, Hibiscus, Bhringraj and *Aloe vera*. Henna leaves and flowers of hibiscus were collected from the herbal garden of PSIT. They were authenticated for their quality in the Pharmacognosy lab of the Institute. Reetha, coffee, tea, shikakai, amla, bhringraj all in the powdered forms were procured from the authorized stores of the local market in the powdered form. Henna leaves and the flowers of Hibiscus were shade dried and coarsely powdered. Then all the ingredients were mixed uniformly to prepare a homogenous formulation. The composition of the formulation is reflected in the table.

Formulation-3

For the preparation of herbal hair dye, we have selected nine important ingredients such as Henna, Reetha, Coffee, Tea, Shikakai, Amla, Hibiscus, Bhringraj and Fenugreek. Henna leaves and flowers of hibiscus were collected from the herbal garden of PSIT. They were authenticated for their quality in the pharmacognosy lab of the Institute. Reetha, coffee, tea, shikakai, amla, bhringraj and Bramhi all in the powdered forms were procured from the authorized stores of the local market in the powdered form. Henna leaves and the flowers of Hibiscus were shade dried and coarsely powdered. Then all the ingredients were mixed uniformly to prepare a homogenous formulation. The composition of the formulation is reflected in the table.

S. No.	Ingredients	Botanical Name	Uses	Formulation (g)
1	Henna	<i>Lawsonia inermis</i>	Hair dyes, hair care products.	25 g
2	Indigo powder	<i>Indigofera tinctoria</i>	Improves hair colour. Soothes hair scalp and follicles.	25 g
3	Amla	<i>Phyllanthus emblicia</i>	A great conditioner for the hair, gives soft and shiny look.	20 g
4	Coffee	<i>Coffea arabica</i>	Stimulate hair follicles. Improves blood circulation to scalp.	5 g
5	Shikakai	<i>Acacia concinna</i>	Natural foaming agent gently cleanses the scalp.	12 g
6	Reetha	<i>Saipindous mukorossi</i>	Used as a cleanser and remove lice from hair.	15 g
7	Hibiscus	<i>Hibiscus Rosa-sinensis</i>	Add volume, treat dandruff, prevent split ends.	10 g
8	Bhringraj	<i>Eclipta prostrata</i>	Increases blood circulation to the scalp and roots.	10 g
9	Fenugreek	<i>Trigonella foenum</i>	It promotes the hair growth treats for hair loss.	22 g
10	Brahmi	<i>Bacopa monnieri</i>	Reduce inflammation and hair loss by treating dandruff.	20 g

Methods of evaluation¹⁸:

The prepared herbal hair dye were evaluated with the following parameters. The prepared herbal hair dye was evaluated for its various parameters, such as organoleptic, physico-chemical, phytoconstituents and the rheological aspects.

Organoleptic Evaluation

Organoleptic characteristics for various sensory characters like color, taste, odour etc. was carefully noted down as illustrated in Table. The raw drugs and powders were separately studied by organoleptic and morphological characters like colour, odour, texture and appearance.

S. No	Parameters	Results
1.	Color	Greenish brown
2.	Odour	Characteristic
3.	Texture	Fine
4.	Appearance	Powder

Physico-Chemical Evaluation

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

S.No.	Parameter	Results
1.	pH	6.7
2.	Loss on drying	1.9 %
3.	Ash value	0.19

Phyto chemical Evaluation

Prepared herbal hair dye was subjected to Phyto-chemical screening to reveal the presence or absence of various phytoconstituents as Carbohydrates, Lipids, Alkaloids, Sugar etc. The formulation when dissolved individually in 5 ml of water and filtered; the filtrates were used to test the presence of carbohydrates. The aqueous extract of the formulated herbal face pack was evaluated for the presence or absence of different phytoconstituents as per the standard procedures and norms.

S. No	Parameter	Results
1.	Foam test	Present
2.	Molisch test	Present
3.	Fehling test	Absent
4.	Hager test	Present
5.	Volatile oil	Absent

Rheological Evaluation

Physical parameters like untapped or bulk density, tapped density, the angle of repose, Hausner's ratio, and carr's index were observed and calculated for the in house formulation. Bulk density symbolizes the adjustment of particles or granules collectively in the packed form. The formula for determination of bulk Density (D) is $D = M/V$ where M is the mass of particles and V the total volume occupied by them. This is determined by taking graduated cylinder. 100 grams of weighed formulation was added to the cylinder with the help of a funnel. The initial volume was noted and the sample was then tapped fully. The bulk density value was obtained from the initial volume and after tapping the volume noticed, from which tapped density was calculated. The angle of repose quantifies the flow properties of powder as it affects cohesion among the different particles. The fixed funnel cone method employs the calculation of Height (H) above the paper that is placed on a flat surface. The pack was carefully poured through the funnel till the formation of the peak. Here, R denotes the radius of the conical heap, $\tan a = H/R$ or $a = \arctan H/R$, where 'a' is the angle of repose. Hausner's ratio is linked with the inter particle friction and influences the powder flow properties. The Hausner's ratio is calculated as D/D' where D' is the tapped density and D, the bulk density. Carr index helps to measure it.

S. No.	Parameters	Results
1.	Bulk density	0.35
2.	Tapped density	0.47 l
3.	Angle of repose	1.04
4.	Carr's index	34.2
5.	Hausner's ratio	1.34

Patch Test

This usually involves dabbing a small amount of the aqueous solution of hair dye behind the ear or on inner elbow in an area of 1sq.cm and leaving it to dry. Signs of irritation or feeling of non wellness is noted, if any. Measured and small quantities of prepared hair pack were applied to the specified area for a fixed time. Irritancy, redness, and swelling were checked and noticed for regular intervals up to 24 hours if any. The results of tests for the signs of irritation.

S. No.	Parameters	Result
1.	Swelling	Negative

2.	Redness	Negative
3.	Irritation	Negative

Stability Test

Stability testing of the prepared formulation was performed by storing it at different temperature conditions for the time period of one month. The packed glass vials of formulation were stored at different temperature conditions viz., room temperature and 35°C and were evaluated for the physical parameters like color, odour, pH, texture, and smoothness.

S. No.	Parameters	Room temperature	35°C
1.	Color	No change	No change
2.	Odour	No change	No change
3.	pH	6.7	6.8
4.	Texture	fine	fine
5.	Smoothness	smooth	smooth

RESULTS AND DISCUSSION:

Four different mixtures were prepared by taking 10 g of powder (Henna, Indigo, Formulations A, B, C) and making a slurry of it. Keep that slurry for 24 hr. Now take a Blonde hair and apply paste on it. Wash it after one hour. The observed color of the henna is reddish-orange while the color of indigo is blue-black. The produced herbal hair dye is made up entirely of beneficial natural components. Due to the ideal herbal combination in this composition, it also functions as a conditioner, anti-dandruff agent, and hair growth stimulator in addition to being a hair dye. The inert nature of the hair dye pack was revealed by a patch test. It is simple to store and stable at temperatures 20 and 35°C. The formulation B shows better hair color than formulation A and C. Which also promotes hair growth, strength and decreases hair damage. When Henna (50%) is mixed with Indigo (30%) along with Amla (4%), Coffee (4%), Shikakai (2%), Reetha (2%), Brahmi (2%), Red Sandalwood (2%), Hibiscus (2%), Bhringraj (2%) the observed hair color become darker after washing. It is devoid of the harmful effects of ammonia-based chemical colors because it is a formulation made from natural herbs. However, consistent use of it results in thick, silky, and beautifully colored hair.

CONCLUSION

A herbal hair pack colors the hair in an utmost gentle manner. The advantages of herbal based cosmetics are their nontoxic nature. It nitrifies the skin of the scalp and hair. This hair formulation provides vital nourishment to the skin. It helps to treat dandruff by removal of excess oil from scalp. Frequent use of this pack leads to manageable, frizz free colored hair. Pollution, ageing, stress and harsh climates badly affect the quality of hair. In this research, we found effective properties of the herbal hair pack and further studies are needed to be performed to explore more useful benefits of this herbal hair pack. Natural remedies are widely accepted with open hands nowadays as they are safer with minimal side effects as compared to the chemical based products. Herbal formulations are in great demand to fulfill the needs of the growing world market. It is a noticeable attempt to formulate the herbal hair pack containing the goodness of powders of different plants, which are excellent for hair care.

REFERENCES

1. Sudheer Kumar K, Begum A, Shashidhar B, Meenu M, Mahender C, Sai Vamsi K. Formulation and Evaluation of 100% Herbal Hair Dye. *International Journal of Advanced Research in Medical & Pharmaceutical Sciences*. 2016; 1(2): 1-5.
2. Ganpat Ashwini, Aswar AR, Hingane LD. Formulation and Evaluation of Herbal Hair Dye. *International Journal of Creative Research Thoughts*. 2021; 9(12): 454-75.
3. Balakrishnan A, Kumar R. Herbal cosmetics: A review. *J Med Plants Stud*. 2012; 1(4): 32-43.
4. Guo EL, Katta R. Diet and hair loss: effects of nutrient deficiency and supplement use. *Dermatol Pract Concept*. 2017; 7(1): 1-10.
5. Habbal O, Hasson SS, El-Hag AH, Al-Mahrooqi Z, Al-Hashmi N, Al-Bimani Z. Antibacterial activity of Lawsonia inermis Linn. (henna) against *Pseudomonas aeruginosa*. *Asian Pac J Trop Biomed*. 2011; 1(3): 173-6.

6. Rashmi Saxena Pal, Yogendra Pal, A.K Rai, Pranay Wal and Ankita Wal. Synthesis and Evaluation of Herbal Based Hair Dye, The Open Dermatology Journal (Bentham Open). 2018; 12; 90-98.
7. Madhav Amle, Review on: Formulation and Evaluation of Herbo mineral Hair Dye. *Journal of Research in Pharmaceutical Science*. 2021; 7(12):1-11.
8. Willamson EM. Major herbs of ayurveda. 2002 :126-8.
9. Lachman L, Lieberman HA, Kanig JL. The Theory and Practice of Industrial Pharmacy. 3rd , 1987.
10. Khandelwal KR. Practical Pharmacognosy 12th Ed. 2004.
11. Upadhyay VP. Mishra A. K. Workshop on selected medicinal plants. 1985. In: Ministry of Commerce, Chemexci: Bombay 1985.
12. Mane AG, Aswar AR, Hingane LD. Formulation and Evaluation of Herbal Hair Dye, *International Journal of Creative Research Thoughts*. 2021; 9(12): 454-475.
13. Z. Shahi, M. Khajeh Mehrizi, M. Hadizadeh, A Review of the Natural Resources Used to Hair Color and Hair Care Products. *Journal of Pharmaceutical Science & Research*. 2017; 9(7): 1026-1030.
14. Vijender S, Mohammed A, Sukirti U. Study of colouring effect of herbal hair formulations on graying hair. *Pharmacognosy Research*. 2015, 7(3): 259–262.
15. Patel MM, Solanki R, Gaurav NC, Patel Pit Verma SS. Method development for Lawsone estimation in Trichap herbal hair powder. by high-performance thin layer chromatography. *Journal of Advanced Pharm*. 2013.
16. Rangari D, Vinod. Natural colorants and dye in: Pharmacognosy and Phytochemistry. Career publication, India. 2004, 98-117.
17. David Mc Junkin, Catherine Mc Lean, and Elizabeth Welsh C. The Laboratory for Historical Colorants at UCLA Laboratory for Historical Colorants, WAAC Newsletter, 1991; 13(3): 21.
18. Patni P, Gahtori A, Bhandari P, Dimri T, Ahmad M. The Herbal Hue: Formulation and Evaluation of Herbal Hair Dye. *Pharmacog Res*. 2024;16(2):294-9.