

Formulation and Evaluation of Herbal Hair Dye

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Abstract: *Background: The plant henna has a natural coloring pigment that is used to dye skin, fingernails, hair, and textiles like leather, silk, and wool. It may also be utilized for impermanent body art. An active ingredient in henna plants identified as "lawsone" is an orange-reddish dye that combines to the protein keratin of human skin to color it. Materials and Methods: Herbal hair dye formulation is prepared to get a darker black natural hair dye that is free from any harmful chemicals. The main constituent used is henna which gives an orangish colour to hair. Different other natural compounds were mixed to get a darker color as well as to protect the hair. The formulation also prevents hair from premature greying, hair fall, cleaning of dandruff, etc. The formulation promotes hair growth and helps to maintain a healthy environment for hair to grow. The main four constituents used for coloring were Henna (50%), Indigo (30%) Coffee (4%) and Amla (4%), which also promote hair growth. Other constituents such as Shikakai (2%), Reetha (2%), Brahmi (2%), Red Sandalwood (2%), Hibiscus (2%), Bhringraj (2%) were mixed to get natural black color to hair. Results: The herbal hair dye pack was formulated, evaluated and its application on the blonde hair was carried out. The two formulations A and B when applied to blonde hair string the color obtained are similar to natural black hair color. Conclusion: However, further studies on the application of formulated hair dye packs on different shades of human hair are required to determine its full range of potential advantages..*

Keywords: Herbal hair dye, Henna, Phytochemical evaluation, Molisch test, Hair dye formulation

I. INTRODUCTION

As compared to the chemical based hair dyes, which cause skin and other skin related diseases, natural herbal dyes are being preferred nowadays. Today most of the human beings are very careful about their beauty and hairs play an important role in this. Herbal drugs without any adverse effects are used for healthy hair. Nearly 70% of human beings above 50 years struggle with the problem of balding and greying of hair. In few cases, these symptoms of ageing occur earlier. Greying starts on the skin of head at about 40 years, starting initially from the temples, followed by beard, moustache and finally up to the chest. The age at which greying starts is deeply influenced by heredity. But premature depigmentation in adults is mainly due to variety of other factors, as illness, some specific drugs, shock etc. People have been using natural dyes since ancient times for the purpose of dyeing carpets, rugs and clothing's by the use of roots, stems, barks, leaves, berries and flowers of various dye yielding plants. The need of herbal based natural medicines is increasing fastly due to their natural goodness and lack of side effects. Amla, Bhringraj, Henna, Mandara, Jatamansi, Reetha, Sariva, Curry leaves and Methi seeds are well-known ayurvedic herbal drugs traditionally used as hair colorant and for hair growth. Many different extracts from plant were used for the purpose of hair dyeing in Europe and Asia before the invention of modern dyes. Indigo, known as natural fabric dye, could be mixed with Henna to make different light brown to black shades of hair dye. Use of these chemicals can result in unpleasant side effects, such as skin irritation, allergy, hair breakage, skin discoloration, unexpected hair colour etc. Continuous application of such compounds on natural hair causes multiple side effects such as skin irritation, allergy, hair fall, dry scalp, erythema and also skin cancer. In India, henna has been used traditionally for colouring palms and hairs. There are so many herbs like Kikar, Bihi, Bhringraj, Patnag, Akhrot, Narra, Jaborandi, Jatamansi, Amla, Kuth, Giloe, Behera which are used as major constituents in hair care preparations mainly meant for dyeing hair. Henna has been used traditionally for colouring women's bodies during marriage and other social celebrations since the times of Bronze Age. It is a part of Islamic and Hindu cultures as a hair coloring and dyeing agent for the purpose of decorating the



nails or for the formation of temporary skin tattoos. Drugs from the Plant sources are easily available, are less expensive, Safe, and efficient and rarely have side effects [18]. In the Present era of eco- conservation, the use of natural dyes Has been revived and reviewed for the coloration of Textiles and food materials.

The plant henna has a natural coloring pigment used to dye skin, fingernails, hair, and textiles like leather, silk, and wool. It may also be used for impermanent body art. An active ingredient in henna plants identified as "lawsone" is an orange-reddish dye that attaches to the protein keratin of human skin to color it. Henna, scientifically identified as *Lawsonia inermis*, has a long-established history of application owing to its natural dyeing properties. The chemical composition of henna comprises a cluster of organic compounds referred to as lawsone or hennotannic acid, which is accountable for the dyeing effect. The henna plant's leaves are the main source of these chemical constituents.

The process of dyeing hair with henna involves a chemical reaction between lawsone and hair proteins. Henna powder is typically mixed with a mildly acidic liquid, like lemon juice or tea, to create a paste. This acidic environment helps activate

the dye molecules in henna.[1] When applied color of the hair, and individual differences in hair chemistry.[6]

The henna shade ranges from intense crimson to pale orange, varying according to the nature of the leaves and the henna paste combination applied.[7]to the hair, the

lawsone molecules in the henna paste penetrate the hair shaft by permeating the outer protective layer, known as the cuticle.[2] Once inside the hair shaft, the lawsone attaches to proteins, specifically keratin, present in the hair. This binding forms

a durable and impermanent dye complex.[3] After lawsone binds to proteins, an oxidation process begins. Exposure to air triggers a chemical reaction which enhances the color of the dye. This oxidation typically takes several hours to fully develop.

Types of hair Dye

1. Permanent hair Dye
2. Demi-Permanent hair Dye
3. Semi- Permanent hair Dye
4. Temporary hair Dye Meaning of Hair Dye

Hair Dye or Practice of hair Coloring changing is the Hair color. The main Reason for this are gray theCosmatic to covee hairs or too change colombo ford Hair which is regarded or asa more fashionable Desirable in todays world. Permanent hair dye In order hair to deposit permanent permanen Dye, the outer of hair shaft ie layer Cuticle must be Opened.. Once the cuticle is opened, the dye react with thinner porolion” of the hear

Ie. Cortex to deposite, or remove the Color. Most permanet Exitiair a chyeuseri a two-step Process, which first Removes the original color of the hair and then deposits.Colormate sub vind bacod Demi-Permanent hair Dye. Demi permanent hair diye jare thase which contains Agent an alkaline other than ammonia e.g. Ethanolamine, sodium carbonate etc.] always employed With a developer. The Concentration of hydrogen Peroxide In that developer may be lower than used with ulitid a Permanent. Demi Permanent cre effective a at much more Covering Gray. Hair than semi-permanent dye but less than hair l Amia 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 grey, reinforces the hair follicles, Amla is the must 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 of light. Thisamla powder is additionally plentiful in in tannins,Minerals like Calcium, Phosphorus, Fe and amino Corrosive. The natural product extricate 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.

1. Amla Powder –

Amia 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 Must 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 of light.





Amala is a traditional Nigerian dish, popular among the Yoruba people. It's made from yam flour (called elubo), plantain flour, or cassava flour.

Nutritional Value:

- High in carbohydrates (energy source).
- Plantain amala has more fiber and is considered healthier.
- Often gluten-free (depending on flour used).

USES:

boosting immunity, promoting hair and skin health, and improving digestive health.

2. Hibiscus Powder :

Is magnificent for expansion in hair development Movement. Hibiscus is normally enhanced with Calcium, Phosphorus, Iron, Vitamin B1, Vitamin C, Riboffavin 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.



USES:

Hibiscus offers several benefits for hair, including stimulating growth, strengthening follicles, and promoting a healthier scalp. It can be used in various forms, such as oils, masks, and rinses, to treat dandruff, hair thinning, and dullness.

2. 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.

tea powder, particularly black and green tea, can be beneficial for hair health when used as a rinse or in a hair mask. It can help stimulate hair growth, reduce hair loss, add shine, and potentially improve scalp health.





USES:

Tea powder contains essential nutrients like vitamin E and iron, which are crucial for maintaining healthy hair. Vitamin E promotes hair growth by supporting a healthy scalp, while iron helps in the production of red blood cells, which carry oxygen and nutrients to the hair follicles.

4.REETHA POWDER-

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 A characteristic cleanser, consequently is utilized in home Grown shampoos as hair chemical Reetha as soap nuts or Washing nuts, assume a significant part as normal hair Car items since more established times. This plant is improved with saponins, which makes the hair solid, Gleaming, and glossy when utilized on customary premise.



Uses:

used in hair care for its cleansing and conditioning properties. It can be used as a shampoo, a conditioner, or mixed with other ingredients to create a hair mask. Reetha powder's benefits for hair include cleansing, adding shine, promoting hair growth, improving hair density, and reducing dandruff.

Heena Powder –

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.





USES:

Henna powder offers various benefits for hair, including conditioning, coloring, and promoting hair health. It can be used to dye hair, cover gray hairs, and improve hair texture. Henna also has medicinal properties that can help with dandruff, hair fall, and scalp conditions.

Rosemary Powder –

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 Gentlycleanses hair. Shine Increases shine. Scalp issues Relieves irritated, dry, faky, dandruff ridden scalps.



USES:

1. Rosemary powder can be used for hair growth, to reduce dandruff, and to improve scalp health.
2. It can also be used in a hair mask or tea rinse.

Advantage

1. Natural appearance of use of real human hair fibre.
2. May be styled as a natural hair.
3. Able to color and perm.
4. Moves like natural hair.
5. Less susceptible to heat damage.



Disadvantages

1. More expensive.
2. Need more maintenance and care.
3. Requires styling.
4. May be heavier in weight than synthetic wigs, which may lead to itching.
5. More susceptible to sunlight fading and environmental damage.

DIAGRAM FOR HERBAL HAIR DYE



AIM: Formulation And Evaluation Of Herbal Hair Dye.

Herbal hair dyes are a great alternative to synthetic dyes. Here are some benefits and options.

Herbal hair dyes are a fantastic way to color your hair naturally. Some popular herbal hair dyes include:

1. Henna: Gives a reddish-brown color and conditions hair.
2. Indigo: Creates a blue-black or dark brown color.
3. Cassia: Adds shine and can create golden highlights.
4. Amla: Enhances dark colors and adds shine.

Objective: 1. Natural coloring: Achieve a natural hair color without using synthetic chemicals.

2. Hair care: Nourish and condition hair while coloring.

3. Less damage: Reduce damage to hair compared to synthetic dyes.

4. Unique shades: Create unique, natural-looking shades.

5. Sustainable: Choose an eco-friendly and sustainable hair coloring option.

Some people also use herbal hair dyes to:



1. Avoid harsh chemicals: Avoid exposure to harsh chemicals found in synthetic dyes.
2. Promote hair health: Promote hair health and strength.
3. Express individuality: Express personal style and individuality through natural hair color.

Review Of Literature: A survey of scholarly sources on a specific topic

- Provides an overview of current knowledge and research approaches
- Identifies relevant theories, methods, and gaps in existing research
- Essential for academic research, helping to establish the context and relevance of your study

Key Components of a Literature Review:

- Introduction: Introduces the topic and provides an overview of the review
- Theoretical Framework: Discusses the theoretical framework guiding the research
- Themes/Categories: Organizes and synthesizes the literature into themes or categories
- Methodology: Describes the research methods used in the studies reviewed
- Synthesis of Literature: Summarizes and interprets the findings of the studies reviewed
- Critical Evaluation: Critically evaluates the strengths and limitations of the studies reviewed
- Conclusion: Summarizes the main findings and implications of the review

Types of Literature Reviews:

- Standalone Literature Review: A comprehensive review of the literature on a specific topic
- Literature Review as a Section of a Research Paper: A review of the literature relevant to the research paper's topic.

Methods of hair dye preparation :-

1. Weighing:

Next a worker weigh out of the ingredient for the batch. For some ingredients, only a small amount of is necessary in the batch. But if a very large batch is being made, and several ingredients are needed in large amounts.

2. Mixing:

In a formula in which no pre mixing is required, after checking and weighing, the ingredients are simply mixemixture. The xtured. The ingredients are completely mixed with each other.

3. Filling:

The finished batch of hair dye products formed place in the filling area. Then the measured amount of hair dye on the weighing balance.

4. Packaging:

From the filling area, the plastic bag are taken to the packaging line. The packaging complete and the labelling of the product write the with full information. Then the It product are them taken to the warehouse to await distribution.

IDEAL PROPERTIES OF HAIR DYE

.should impart the same color which it indicates on its label.

- It must color the hairs only and not the skin.
- The color that it imparts to the hair must be stable to air, light, water and shampoo.
- It should be easy to apply.
- It should have reasonable stability or shelf life.
- It should not be toxic to the skin or hair and should not impart the natural gloss and texture of the hair.
- It should not be allergic and a dermatitis sensitizer.
- It should impart color to the hair in a short contact time.

Composition of Hair dye
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- Differ from manufacturer to manufacturer.
- In general, hair dyes include dyes, Modifiers
Antioxidants Alkali
Soaps Ammonia Wetting agents Fragrance

RESULT

The prepared herbal hair dye contains all the goodness of natural ingredients. Shikakai is packed with vitamin A, C, D and K, which together form a powerful antioxidant. This antioxidant is probably the only thing your hair needs to clean the scalp of the sebum buildup unclog pores, and hair growth. Coffee for hair strengthens hair by improving the overall quality and texture of it. Hibiscus is excellent for hair growth activity. Custard apple pulp powder is help with premature greying of hair. Custard apple is a great natural source of copper and gives hair the dark melanin colour. Organoleptic evaluation finding revealed that the pack is smooth and pleasant smelling powder. Phytoconstituents, which acts as true nourisher for the scalp as well as hair. The protein of hair stability tests performed at different temperature. The formulation was found to be stable.

II. CONCLUSION

Herbal hair dyes offer a natural and sustainable alternative to synthetic hair dyes. With their gentle, non-toxic ingredients and potential benefits for hair health, herbal hair dyes are an attractive option for those seeking a more natural approach to hair coloring. While results may vary and color payoff might differ from synthetic dyes, the benefits of herbal hair dyes make them a worthwhile consideration for many individuals. As the demand for natural and eco-friendly products continues to grow, herbal hair dyes are poised to become an increasingly popular choice for hair care and coloring.

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