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**Research Article**

# "Formulation And Evaluation Of Herbal Hair Dye Using Platycladus Orientalis For Preventing Hair Loss"

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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 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 colourplan.In my research work I'm using PlatycladusOrientalis for reducing hair loss also.

**Keywords :-** **H**eena,Indigo,Patycladus orientalise, Hair loss, Hereditary, Herbal hair dye.

## INTRODUCTION

As compared to the chemical based hair dyes, which cause skin related diseases, natural herbal dyes are being preferred nowadays. 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 graying of hair. Useful products can be derived from any part of the plant like bark, leaves, flowers, seeds etc. Plant products have been part of phytomedicines since times immemorial. A need was felt to formulate a product containing only plant products, which is safe for use and does not have the problems of staining skin during use and hypersensitive reactions. In the present investigation the formulations are developed to get natural black colour using combination of different plant materials. The dye was prepared based on experiences of several people who were using different plant products for colouring their hair without having any problems of irritancy, allergy or sensitivity. The need of herbal based natural medicines is increasing fastly due to their natural goodness and lack of side effects. Amla, bhringraj, Henna, Jatamansi, Reetha, Methi, lohbhasma, Orange peel powder, Brahmi, shikakai, are well known ayurvedicherbaldrugs 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 morden hair dyes. Indigo, known as initial 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, dryscalp, erythema and also skin cancer. In india, henna has been traditionally for coloring palms and hairs. There are so many herbs like bhringraj, jatamansi, amla, methi, reetha, shikakai, are used as some major constituents in hair care preparations mainly meant for dyeing hair. Drugs from the plant sources are easily available, are less expensive, safe and efficient and rarely have side effects.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 inview 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. **(1,2)**

## Hair Dye

Herbal hair dye offers a natural and gentle alternative to conventional chemical dyes, harnessing the power of plant-based ingredients like henna, indigo, and amla to color and nourish the hair. Unlike synthetic dyes that often contain harsh chemicals, herbal dyes are kinder to both the hair and scalp, making them suitable for individuals with sensitive skin or allergies. Beyond providing vibrant color, herbal hair dye also promotes healthier hair by improving texture, increasing shine, and enhancing overall hair health with its versatility in application methods and long-term benefits, herbal hair dye invites individuals to embrace a more natural approach to hair coloring, celebrating the beauty of botanicals and the transformative power of nature. In recent years, there has been a notable shift towards natural and sustainable beauty practices, leading to the resurgence of herbal hair dye in the beauty industry. This comprehensive overview aims to delve into the world of herbal hair dye, examining its origins, ingredients, benefits, application methods, and cultural significance. By exploring the rich history and modern-day applications of herbal hair dye, this overview seeks to provide readers with a deeper understanding of this natural alternative to conventional hair coloring products.**(3)**

## Types of Hair Dye

### A. Temporary

- These form of hair hues used to shade the hair for Temporality.
- The colorants which are used would not penetrate into the hair or surrounding. maybe without difficulty rinsed off water one shampooing.
- Temporary hair colouring some time used to use finely floor metals via a puffer spray.
- In rinse aqueous or hydro alcoholic solution of simple dye stuffs are used. **(4)**

### B. Permanent

- Semi-permanent dye includes particularly either Nitrophenylene diamines Or Nitroaminophenes or both Aminoantrhaquinoes.
- Shampoo is the maximum generally used base.
- Overall performance of colorants may be enhanced by the inclusion of solvent.
- Most of them are primary dye stuffs, whose cationic person offers them a natural affinity for the hair. **(5,6)**

### C. Permanent

- Maximum popular hair dye merchandise.
- The dyes are shaped throughout the dyeing technique and aren't present, as such in the solution before application.
- They motive some hair damage.
- Permanent dye systems are capable of dye hair a lighter colour than the original.
- Includes elements ; Dye intermediate , Oxidizing agent.**(7,8)**

## Advantages

- ✓ Herbal appearance of use of real human hair fibre.
- ✓ Can be styled as a natural hair.
- ✓ Capable of coloration.
- ✓ Movements like natural hair.
- ✓ Much less susceptible to warmth harm.
- ✓ Customized Color.

## Ideal Property Of Herbal Hair Dye

• **Natural ingredients:** Herbal hair dyes should be made from natural plant-based ingredients, such as henna, indigo, amla, and herbs like chamomile and rosemary. Avoidance of synthetic chemicals reduces the risk of adverse reactions and supports sustainability.

• **Gentle on Hair:** The dye should be gentle on the hair and scalp, avoiding harsh chemicals like ammonia and peroxide, which can cause damage, dryness, and breakage.

• **Long-Lasting Color:** A good herbal hair dye should provide vibrant and long-lasting color. This ensures that the dye doesn't fade quickly, reducing the frequency of reapplication.**(9,10)**

• **Coverage of Gray Hair:** Effective coverage of gray hair is essential for many users. Herbal dyes should have good coverage capabilities, especially for those with significant gray or white hair.

• **Customizable Shades:** Offering a range of shades allows users to customize their hair color to match their preferences. This flexibility ensures that individuals can achieve the desired look, whether it's a rich brown, deep black, or vibrant red.

• **No Harsh Chemicals:** Herbal hair dyes should be free from harsh chemicals, such as parabens, sulfates, and synthetic fragrances, which can irritate the scalp and cause allergic reactions.

• **Moisturizing and Nourishing:** Ingredients that moisturize and nourish the hair, such as natural oils and plant extracts, can help maintain hair health and shine during the coloring process.

• **Ease of Application:** A user-friendly application process makes dyeing hair at home convenient and hassle-free. Clear instructions and packaging that minimizes mess are beneficial. **(11,12)**

• **Environmental Sustainability:** Using sustainably sourced ingredients and eco-friendly packaging reduces the environmental impact of the product. Biodegradable or recyclable packaging is a plus.

• **Ethical Sourcing :** Ensuring that ingredients are ethically sourced, with fair labor practices and respect for local communities, reflects a commitment to social responsibility.

• **Allergy Testing :** Providing allergy testing instructions or pre-packaged skin sensitivity tests helps users avoid adverse reactions.**(13,14)**

## USES

- More steeply-priced.
- Want extra protection and care.
- Requires styling.
- Can be heavier in weight after applying, which may cause itching.**(15)**

## Problems associated with synthetic hair dye

Almost every synthetic hair dyes contain Ammonia, Para-Phenylenediamine (PPD), Hydrogen Peroxide, Resorcinol, Paraben etc. They play critical role in the development of hair dyes. Although the PPD is used for dark color shades, it should not be applied repetitively for long period of time. PPD is an important constituent of hair dye toxicity of which one could herald fatal complications such as rhabdomyolysis, renal failure and respiratory failure. As well as Ammonia, Paraben and Hydrogen Peroxide are harmful chemical contained in hair dyes which cause toxicity to human body.

Ammonia containing hair dye is used to open the hair's cuticle so that the dye can come into the shaft. In spite of its useful activity it has various side effects such as damaged cortex, lung irritation, frizzy & brittle hair, etc. Along with PPD and Ammonia, Paraben, Hydrogen Peroxide and Resorcinol also have various toxic effects on human body such as hormonal imbalance, fertility complications, irritation on scalp, drying of hair, flakes and even hair loss. These chemicals cause eye and lung irritation, hair breakage, dandruff, chemical burns and sometimes cancers as properly.

## Mechanism of Hair Dying

Human Hair is a protein fiber made of two layers. The inner layer called cortex contains melanin. Melanin is a pigment which gives your hair shades of blonde, black, auburn or brown. Cortex is covered by another layer called cuticle. Cuticle provides protection to cortex and luster to your hair. Cuticle is inert in nature so it cannot biologically or chemically absorb any color. **(16)**

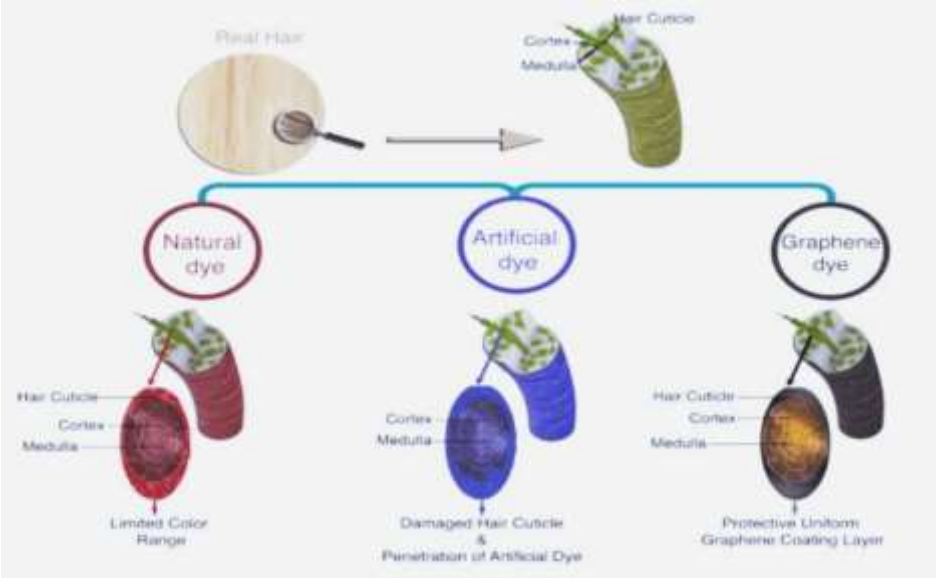


**Fig.No.1 Mechanism of Hair Dying**

- **By Chemical Dye:** Most of the chemical dyes contain bleaching agents such as ammonia and/or peroxide which damage the outer most layer and create capillaries in hair shaft. Then PPD, OPD, MPD like chemical color fills these capillaries, enter in the inner layer and remain stuck inside, as permanent color. The next application again does the same on hair shaft. This results in loss of strength, roughness and permanent damage to hair.

- **By Natural Dye:** Natural Dye colors hair by coating the hair shaft. It provides thickness to hair and stick as a semi-permanent color. The next application again does the same and results in increase in strength and shine in your hair. **(17)**

## METHODS AND MATERIAL

**Formulation:-**
For the prepration of herbal hair dye we have to select ingredients which are good for colouration and also hlepfull for prevent the hair fall such as .
**Procedure:-**
**STEP:I** Collection of plant materials from local market.
**STEP:II** Evaluation of purity and quality of raw materials by morphological, physical and chemical techniques, studies were performed..
**STEP:III** All the drugs were made into powder weighed according to the formula mentioned.
**STEP:IV** Prepared herbal hair dye formulas - (H.H.D-I to H.H.D-V).
**STEP:V** Finally prepared hair dye are evaluated.**(18,19)**

**Fig No.2 Herbal Ingredients Used In Formulation**

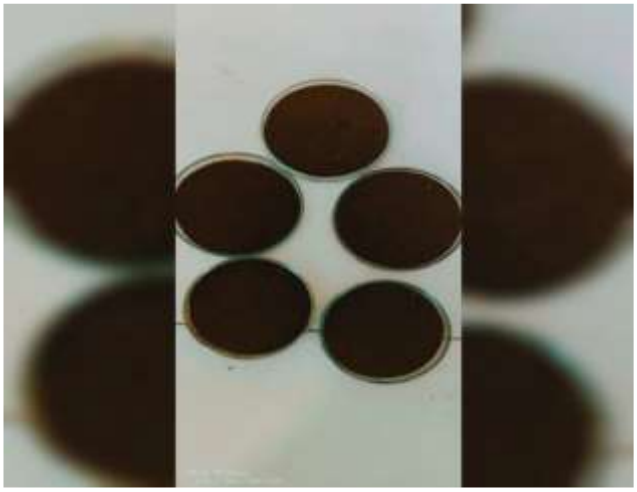

**Fig No.3 Formulation of herbal Dye**

## Formulation table

**Table.1For composition of herbal hair dye**

| Ingredients | H.H.D I | H.H.D II | H.H.D III | H.H.D IV | H.H.D I |
|---|---|---|---|---|---|
| Heena | 30 | 20 | 15 | 5 | 0 |
| Indigo | 0 | 10 | 15 | 25 | 30 |
| Amla | 2 | 2 | 2 | 2 | 2 |
| Tulsi | 5 | 5 | 5 | 5 | 5 |
| Platycladus orientalis | 3 | 2 | 2 | 3 | 4 |
| Loha bhasma | 2 | 3 | 3 | 2 | 1 |
| Fenugreek | 2 | 2 | 2 | 2 | 2 |
| Bhringraj | 2 | 2 | 2 | 2 | 2 |
| Black catechu | 2 | 2 | 2 | 2 | 2 |
| Aloevera | 2 | 2 | 2 | 2 | 2 |
| Water | qs | qs | qs | qs | qs |
| Total | 50 | 50 | 50 | 50 | 50 |

## EVALUATION

### Evaluation of the Herbal Hair Dye

### Preformulation parameter

The prepared herbal hair dye was evaluated for its various parameters, such as organoleptic, physicochemical, phytoconstituents and the rheological aspects.

**Table.2 Preformulation parameter**

| S.No. | Formulation | Bulk density | Tapped density | Angle of repose |
|---|---|---|---|---|
| 1 | F1 | 0.44 | 0.66 | 26.92 |
| 2 | F2 | 0.43 | 0.64 | 27.02 |
| 3 | F3 | 0.42 | 0.63 | 26.01 |
| 4 | F4 | 0.41 | 0.71 | 29.00 |
| 5 | F5 | 0.39 | 0.60 | 0.54 |

### 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.**(20,21)**

**Table.3 Organoleptic evaluation**

| S.NO. | Parameter | F1 | F2 | F3 | F4 | F5 |
|---|---|---|---|---|---|---|
| 1 | Colour | Greenish brown | Greenish brown | Brown | Brown | Reddish brown |
| 2 | Odour | Characterstics | Characterstics | Characterstics | Characterstics | Characterstics |
| 3 | Texture | Fine | Fine | Fine | Fine | Fine |
| 4 | Appearance | Powder | Powder | Powder | Powder | Powder |

## Physico-chemical evaluation

Physical and chemical features of hair dye were evaluated to determine the PH, its moisture content its ash value for the purpose of stability.**(22,23)**

**Table.4 Physico- chemical evaluation**

| S.NO. | Parameter | F1 | F2 | F3 | F4 | F5 |
|---|---|---|---|---|---|---|
| 1 | PH | 5 | 6 | 6 | 5 | 6.69 |
| 2 | Loss of drying | 3.2 | 3.4 | 3.5 | 3.2 | 3.1 |
| 3 | Ash value | 0.67 | 0.75 | 0.72 | 0.71 | 0.69 |

## Chemical test evaluation

Prepared herbal hair dye was subjected to chemical screening to reveal the presence or absence of chemical constituents such as carbohydrates.**(24,25)**

**Table.5 Chemical test evaluation**

| S.NO. | Parameter | F1 | F2 | F3 | F4 | F5 |
|---|---|---|---|---|---|---|
| 1 | Foam test | Present | Present | Present | Present | Present |
| 2 | Molish test | Present | Present | Present | Present | Present |
| 3 | Fehling test | Present | Present | Present | Present | Present |

## RESULT AND DISCUSSION

The prepared hair dye contains all goodness of natural ingredients. Apart from acting as a hair dye, this formulation because of goodness of herbs used in this formulation also act as the hair growth promoter, hair nourishshers, conditioners and antidandruff agent as well. Henna acting as the base powder.Organoleptic evaluation findings revealed that the dye is smooth and pleasant smelling powder . Physicochemical parameters reflected that the moisture content was as minimal pH was found neutral to suit the requirements of different scalp types . Ash value was found to be nominal . It shows the presence of major phytoconstituents , which acts as true nourisher for the scalp as well hair . Irritancy test revealed negative results irritancy , redness and swelling from the above observations, it has been signified that since the formulation is constituted with naturally occurring dried herbal ingredients , there are almost minimal possibilities of the deterioration of the formulation , as there is no moisture containing substance in either raw or processed form . This study exhibits a powder based formulation of plant powder which is ready to use from dyeing study it is evident that all powder formulation showed dyeing effect. Formulation 5 showed the more dyeing effect than other four formulations, so formulation five has good dyeing properties with adequate stability.

## CONCLUSION

It can be concluded from the investigation that by changing the proportion of Henna and Indigo a suitable Black color could be obtain for hair. A pH of 6.69 (H.H.D-V) was best for penetration of hair colorant. Repeat application of henna and indigo product given increasing the color intensity. Advantage of this natural hair dye is, it does not cause any skin irritation, erythrema formation and edema. It is prepared from100% water soluble plant ingredients; hence it is free from any noxious odor. The raw materials used and the final product is totally biodegradable. The solvent and carrier used in the whole preparation is only distilled water. The product is stable at room temperature. This 100% natural herbal hair dye is suitable for all age groups.The composition and mode of preparation is environmental friendly.

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