



## FORMULATION AND PRELIMINARY EVALUATION OF NATURAL HAIR COLORANT

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### ABSTRACT

Loss of colors in hair is due to various reasons like genetic influence, effect of environmental factors, use of alcoholic preparations etc. Though the permanent synthetic hair dyes are available in different ranges and retain natural luster, they have the chief disadvantage of producing hypersensitive reactions in some individuals. From ancient days, various plant materials like Henna, Indigo, Chamomile, Shoe flower etc are used to dye grey hair to get natural black color. But instead of getting black color shades of red to copper color are obtained. A need was felt to formulate a dye 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 using different combinations of Henna and Indigo along with other herbs.

### KEY WORDS

Henna, Indigo, hair colorant, natural, Ritha

### INTRODUCTION

Hair dye is one of the oldest known beauty preparations, and was used by ancient cultures in many parts of the world. Ancient Egyptians, Greeks, Hebrews, Persians, Chinese, and early Hindu literature mention the use of hair coloring agents. Early hair dyes were made from plants, metallic compounds, or a mixture of the two. Rock alum, quicklime, and wood ash were used for bleaching hair in Roman times. Herbal preparations included mullein, birch bark, saffron, myrrh, and turmeric<sup>1</sup>. Many different plant extracts were used for hair dye in Europe and Asia before the advent of modern dyes. Indigo, known primarily as a fabric dye, could be combined with henna to make light brown to black shades of hair dye<sup>2</sup>. An extract of the flowers

of the chamomile plant was long used to lighten hair, and this is still used in many modern hair preparations. The bark and leaves, or nutshells of many trees were used for hair dyes. Wood from the Brazilwood tree yielded brown hair dyes, and another hair dye known in antiquity as *fustic* was derived from a tree similar to the mulberry. Other dyes were produced from walnut leaves or nut husks, and from the galls, a species of oak trees. Some of these plant-derived dyes were mixed with metals such as copper and iron, to produce more lasting or richer shades.

Most hair coloring agents rely on harsh chemicals like 1-3% phenylenediamine<sup>3</sup>. The word "natural" on a bottle of hair color does not necessarily mean chemical-free. Some brands commonly found in



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natural products stores rely on peroxide to prepare the hair for their colorants. These chemicals have serious side effects like hypersensitivity<sup>4</sup>. They weaken and destroy the hair shaft over time. Additionally, many of the chemical hair colorants use various petroleum or coal tar-based ingredients derived from the environmentally harmful processing of oil or coal tar-based ingredients that have been found over time. This increases the long-term risk of various forms of cancer. In contrast, henna has a long history as a safe and gentle hair color. The Food and Drug Administration has issued a monograph that approves henna for the use as hair colorant. Henna is one of a select group of natural products to achieve official FDA recognition. Therefore, need was felt to formulate a dye containing only plant products which is safe for use and does not have the problems like staining skin during use and hypersensitive reactions. The present study aims to formulate and evaluate polyherbal hair colorant which is safe to use.

### MATERIALS AND METHODS

The following plants were used in the study.

Henna:(*Lawsonia inermis* Linn)<sup>5</sup>

Tea powder:(*Camellia sinesis*)<sup>5</sup>

Indigo:(*Indigofera tinctoria* Linn)<sup>6</sup>

Maka:(*Lepidium meyenii*)

Pale catechu:(*Uncaria gambier*)

Gulvel:(*Tinospora cordifolia*)

Baheda:(*Terminalia belerica* Linn)<sup>6</sup>

Aloevera:(*Aloe barbadensis* Mill)

Cinnamon:(*Cinnamomum zeylanicum* Breyn)

Shoe flower:(*Hibiscus rosasinensis* Linn)<sup>7</sup>

Brahmi:(*Centella asiatica* Linn.)<sup>7</sup>

The powders of Henna, Indigo, Brahmi, Tea,, catechu, Cinnamon, Shoe flower, Baheda, Aloevera. Gulwel, Maka were procured from the market

### COLLECTION OF UNPIGMENTED HAIR

The human hair was collected from barber shops from which white hairs were separated and used for study.

### EXPRIMENTAL

The procedure was followed by modifying the method given by Tomer and Sethiya<sup>8</sup>. Suitable combinations of henna and indigo were taken and mixed in different proportions and rests of the powders were added in it to make a smooth paste (Table 1).

Table 1.  
Formulations of suitable combination of Henna and Indigo.

Formulations	Proportion in which the ingredients are used					
	SF1	SF 2	SF 3	SF 4	SF 5	SF 6
Henna: Indigo	2:1	3:1	4:1	1:1	1:2	1:3
Brahmi	0.2	0.2	0.2	0.2	0.2	0.2
Maka	0.2	0.2	0.2	0.2	0.2	0.2

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Gulwel	0.2	0.2	0.2	0.2	0.2	0.2
Baheda	0.2	0.2	0.2	0.2	0.2	0.2
Pale catechu	0.4	0.4	0.4	0.4	0.4	0.4
Tea	0.1	0.1	0.1	0.1	0.1	0.1
Aloevera	0.1	0.1	0.1	0.1	0.1	0.1
Cinnamon	0.1	0.1	0.1	0.1	0.1	0.1
Shoeflower	0.1	0.1	0.1	0.1	0.1	0.1

The pastes were prepared in water and kept in iron container for 8 hrs. Six groups for different formulations were prepared and formulations were applied to the grey hair and kept for 3 hrs. The hairs were washed after 3hrs with Ritha solution which is normally used in herbal shampoo. The hairs after washing were pasted on white sheet and covered with cellophane. The colored hair were exposed to sunlight for 7 days and again washed as per previous method.

### RESULTS AND DISCUSSION

In the formulations SF 1, SF 2 and SF 3 proportion of Henna is more than that of Indigo. In formulations SF4, SF 5 and SF 6 proportion of Indigo is more than that of Henna. It has been observed that formulations SF 1, SF 2 and SF 3 showed darker color as compared to SF4, SF 5 and SF 6 (Figure 1 and 2).



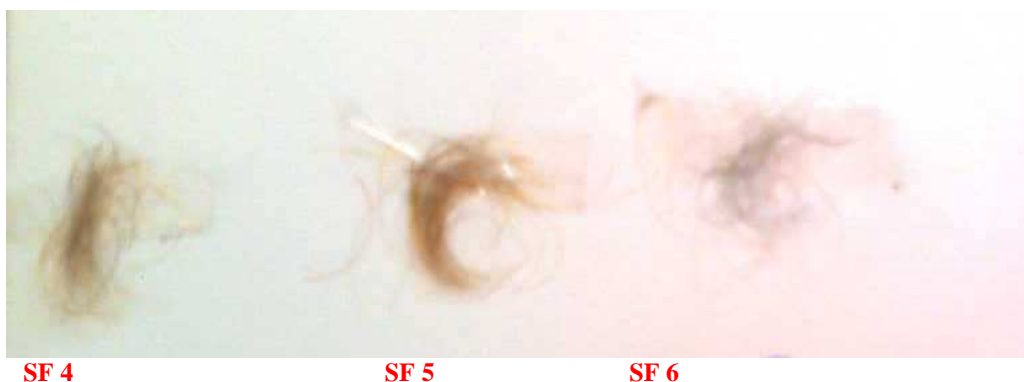
SF 1

SF 2

SF 3

**Fig.1 Effect of formulation SF1, SF2 and SF3 on 1<sup>st</sup> day**

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*Fig .2 Effect of formulation SF4, SF5 and SF6 on 1<sup>st</sup> day.*

The colored hairs were then exposed to sunlight for 2 hrs daily. All the groups were washed with Ritha and on seventh day the change in the color was observed (Figure 3 and 4). It was observed that there was no color change after exposing the hair to sunlight and washing after 7 days.



*Fig .3 Effect of formulation SF1, SF2 and SF3 on 7<sup>th</sup> day after washing.*

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SF 4

SF 5

SF 6

*Fig .4 Effect of formulation SF4, SF5 and SF6 on 7<sup>th</sup> day after washing.*

Also the formulations did not cause any irritation of nails or fingers during preparing as well as application and washing.

### CONCLUSION

The formulation was found to produce excellent coloration on application. The formulation did not cause any irritation to the skin. As the results were found to be encouraging, the authors would like to work further for developing the suitable formulation for further studies.

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