



## FORMULATION AND EVALUATION OF POLYHERBAL HAIR DYE BY USING BEET ROOT

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Hair, dye, polyherbal.

### ABSTRACT

**Background:** To prepare and evaluate of Polyherbal hair dye containing Beet root powder.

**Material and Methods:** Polyherbal hair dye was prepared by simple blending method.

**Results:** Formulation containing natural coloring agents and synthetic urea both showed satisfactory dye on hair after 24 hours. But best formulation was selected on the basis of coloring and nourishing property without urea. F2 and F4 formulation were not suitable as a safe for hair dye as compare to formulation F1 and F3.

**Conclusion:** The formulation F3 containing natural coloring agents and nourishing agents was selected as an optimized formulation because it gave best dyeing property without urea and hair were not roughed after several washing due to addition of natural nourishing agents in formulation.

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### INTRODUCTION

The word herbal is a symbol of safety in comparison to the synthetic one which has adverse effects on human health. A dye can generally be described as a colored substance that has an affinity to color the fiber, fur or hair. Melanin is what gives color to human skin, eyes, and hair. It's the ratio of two types of melanin Eumelanin and Pheomelanin that determines your natural hair color. Graying of hair is natural phenomenon attributable to ageing and frequent use of synthetic shampoos which are encouraged application of synthetic dyes. Hair dyes can be divided into five categories, each with a specific composition and action mechanism: gradual hair coloring (using metallic dyes such as salts of lead, bismuth or silver), vegetable hair dyes (such as henna), temporary dyes (water-soluble dyes that withstand only one-time shampooing), semi-permanent dyes (which can withstand 4-5 times of shampooing) and permanent hair colors. Hair dyes include varieties of chemicals like dyes modifiers, alkalizers, soaps, ammonia, wetting agents, fragrance, antioxidants, that impart special qualities to hair such as softening the texture or give a desired action to the dye but the Continuous usage of such compounds causes many side effects such as skin irritation, erythema, loss or damage of hair and skin cancer. Drugs from the plant sources are easily available, are less expensive, safe, and efficient and rarely have side effects therefore the main

aim and objective of present study is Formulation and evaluation of polyherbal hair dye containing Beet root powder, investigating the alternative to the synthetic and semi synthetic dyes. [K.Sudheer Kumar *et al*, 2016].

### MATERIAL AND METHODS

Powder of beet root, henna, ratanjot, Bhringraj, Amla, Shikakai, Methi seeds were purchased market (Herbal medical shop) from and urea was purchased from Loba Chemicals (Mumbai, India).

#### Preparation of Polyherbal hair dye

The powder of beet root, Henna, Ratanjot, Bhringraj, Amla, Shikakai, Methi seeds were passed through the sieve number 80. These powder materials were studied for their Morphological, Physical and Phyto-chemical identifications. All powder material were weighed and mixed uniformly according to the formula and packed them. (Prepare smooth paste of this powder formulation before 10 minutes of application on hair). The human hair was collected from barber shops from which white hairs were separated and used for study. Then the white hairs were soaked separately in smooth paste of polyherbal hair dye for 5 hours for analysis of better hair dyeing. Then hair was washed with water for further studies. The coloured hairs are observed under the compound microscope (Motic Microscope). [K.Sudheer Kumar *et al*, 2016].

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**Table 1** Formula for different batches of Polyherbal hair dye

Ingredients	Formulation code (Quantities in gm)			
	F1	F2	F3	F4
Beet fruit	3	3.2	4.4	4.5
Henna	1	1	2.3	2.4
Ratanjot	0.8	0.2	1.1	1
Bhringraj	0.2	0.2	0.6	0.4
Amla	-	-	0.6	0.4
Shikakai	-	-	0.6	0.4
Methi seeds	-	-	0.6	0.4
Urea		0.4	-	0.5

**Characterization of polyherbal hair dye**

**Study on dyeing effect**

In this parameter check the Physical appearances, Duration of exposure, Coloring effects and pH of formulations. [K.Sudheer Kumar *et al*, 2016].

**Microscopic study**

Microscopic study of coloured hair was studied using digital microscope. [Y. Madhusudan Rao *et al*, 2006]

**RESULT**

**Table 2** Study on Dyeing Effect

Study on Dyeing Effect	Formulation F1	Formulation F2	Formulation F3	Formulation F4
Physical Appearances	No Damage	No Damage	No Damage	No Damage
Duration of exposure	5 Hrs	5 Hrs	5 Hrs	5 Hrs
Coloring Effects and other property	Good (no nourishing property)	Good (contain urea)	Good (nourishing property)	Good (contain urea)
pH	6.7	6.7	6.8	6.5

Microscopic view of human white Hair treated with formulated Herbal Hair Dyes (After 5hrs)



**Fig 1** normal white hair



**Fig 2** Formulation F1



**Fig 3** Formulation F2



**Fig 4** Formulation F3



**Fig 5** Formulation F4

The above microscopic view showed the better colour in the medulla of white hairs. In the figure 1: showing the normal white hair of human, having no pigmentation in medulla. In the figure 2: showing white hairs dyed with the formulation F1 stated in formulation composition table. It showed good colouring in hair medulla but, the F1 formulation has no nourishing agents. In the figure 3: showing white hairs dyed with the formulation F2 which consist of urea as the colour enhancer. The results obtained are good penetration of dye but the edges are seemed to be dark in colour but, F2 formulation contains urea that is synthetic. In the figure 4: showing hairs dyed with the formulation F3 which does not contain the urea but contain the hair nourishing agents like amla, shikakai, methi seeds, The results obtained were best. It showed reddish orange colour in medullary area of hair. In the figure 5: showing hair dyed with the Formulation F4 which shows good colouring to hair, but it contain the urea as colour enhancer in hair dye.

From all above investigation it has been observed that formulation F1 and F3 has shown good colouring without any colouring enhancer like as urea. While the formulation batch F2 and F4 also shown better results as shown above but, these

formulation contains the urea for penetration purpose. Thus this formulation is not suitable for the hair colouring as compare to batch F1 and F3. The formulation batch F3 is said to be optimized because it showed best dyeing property without urea and also the hair were not roughed after several washing due to natural nourishing agents were added in the formulation batch F3.

After the evaluation parameters were checked the pH of batch F3 was found to be 6.8 which are approximately to pH of hair. The pH of other three batches F1, F2 and F4 the pH was found to be 6.7, 6.7 and 6.5 respectively. The dyed hairs were washes at several times but there was no change in the dyed hairs.

## DISCUSSION

Four formulation of polyherbal hair dye was prepared using Beet fruit, Henna, Ratanjot, Bhiringraj, Amla, Shikakai, Methi seeds and Urea. Prepared dye formulations were evaluated for its dyeing effect and pH. Formulation F3 was optimized as it results were found to be best. Hence it proves that there is no need of using synthetic agents or enhancers for better hair dyeing. Repeated application increases in colour intensity.

## CONCLUSION

The data obtained from the study of "Formulation and evaluation of polyherbal hair dye by using beet root" Reveals following conclusion:

In the present study, a satisfactory attempt has been made to formulate polyherbal hair dye of beet root by changing the proportion of beet and henna, suitable orange- red colour would be obtained for hairs. Formulation F2 and F4 are formulated by using urea as a colour enhancer; it increases the penetration of colour in the hair medulla. But the Formulation F1 and F3 are prepared without using urea, and it showed the good penetration of colour as compare to Formulation F2 and F4. After studying under compound microscope it came to conclusion that the Formulation F3 showed best penetration in hair medulla at pH 6.8 it did not showed any irritation and damage to the scalp. The other three batches were found to be not suitable for hair dye due to some lack of better dyeing hence Formulation F3 was optimized as it results were found to be best. Hence it proves that there is no need of using synthetic agents or enhancers for better hair dyeing. Repeated application increases in colour intensity. The active ingredients present in the hair dye are non-toxic and devoid of any side effects. It is prepared from 100% water soluble plant ingredient; hence it is free from noxious odor. The pigment penetrates deep into the medulla without rupturing the cortex. The solvent and carriers used in whole preparation is only distilled water. The composition and evaluation is completely environmental friendly.

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