

Formulation and Evaluation of 100% Herbal Hair Dye

K.Sudheer Kumar*, Afreen Begum, B.Shashidhar, M.Meenu, C.Mahender, K.Sai Vamsi
Dept. of Pharmacology, Chilkur Balaji College of Pharmacy, Aziz Nagar, Hyderabad, Telangana
E-mail: sudheer.y2k8@gmail.com

ABSTRACT:

The word herbal is a symbol of safety in contrast to the synthetic one which has adverse effects on human health. Herbal preparations viz., herbal tablets, herbal tonics, herbal paste, herbal shampoo, herbal contraceptives and herbal dyes has become popular among the consumer herbal medicines represent the fastest growing segment to heal the various ailments. A dye can generally be described as a colored substance that has an affinity to 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. Hair dyes include dyes modifiers, antioxidants, alkalizers, soaps, ammonia, wetting agents, fragrance, and a variety of other chemicals used in small amounts that impart special qualities to hair such as softening the texture or give a desired action to the dye. The chemicals that are normally used in the dye are amino compounds (4-amino-2-hydroxytoluene and m-Aminophenol). Metal oxides, such as titanium dioxide and iron oxide, are also often used as colorants in the process. Continuous usage of such compounds containing dye on natural hair causes so many side effects such as skin irritation, erythema, loss or damage of hair and skin cancer. The main aim and objective of present study is Formulation and evaluation of Herbal Hair Dye, investigating the alternative to the synthetic and semi synthetic dyes.

Key Words: Melanin, Eumelanin, Pheomelanin

I.INTRODUCTION

Since ancient times, researchers have been exploring nature in search of new drugs. Useful products can be derived from any part of the plant like bark, leaves, flowers, seeds etc. Plant products have been part of phyto medicines since times immemorial. For primary healthcare, around 80% of world s population relies on traditional medicines, involving plant extracts. In traditional systems of Unani, Ayurveda, Homeopathy, and Siddha, almost 90% of prescriptions were based on drugs obtained from plants. Drugs from the plant sources are easily available, are less expensive, safe, and efficient and rarely have side effects. The ancients also used saffron, indigo, and alfalfa. But natural dyes only coat the hair temporarily, and people wanted chemically altered tresses. Graying of hair is natural phenomenon attributable to ageing and frequent use of synthetic shampoos which are encouraged application of synthetic dyes with the increase in the use age of hazards chemicals in the process of manufacturing hence an attempt has been made to review the use of natural products obtained from plants sources to replace the synthetic dyes. A dye can generally be described as a colored substance that has an affinity to the fiber, fur or hair. The dye is generally applied as aqueous solution, and may require a mordant to improve the fastness of the dye on the fiber, fur or hair. Natural dyes also referred as mordant dyes. Different mordant will give different hue color with the same dye. A mordant is thus an agent which allows a reaction to occur between the dye and the fiber, hair or fur. Hair dyes include dyes modifiers, antioxidants, alkalizers, soaps, ammonia, wetting agents, fragrance, and a variety of other chemicals used in small amounts that impart special qualities to hair such as softening the texture or give a desired action to the dye. The chemicals that are normally used in the dye are amino compounds (4-amino-2-hydroxytoluene and m-Aminophenol). Metal oxides, such as titanium dioxide and iron oxide, are also often used as colorants in the process. Continuous usage of such compounds containing dye on natural hair causes so many side effects such as skin irritation, erythema, loss or damage of hair and skin cancer.

II.PLAN OF WORK

Selection of Herbs, All the herbs were selected based on literature review, Fresh leaves of Aloe vera were collected, washed thoroughly and the outer surface has been peeled off and inner mass was collected with the help of scoop, and leaves of Henna (Lawsonia innermis), Psidium guajava, Tulsi (holy basil), Nilika (Indigofera tinctoria) were collected and dried under shade, fruits of Amla (Phyllanthus emblica), and seeds of Fenugreek (Trigonella foenum

graecum) were procured. Black catechu (*Acacia catechu*) and whole herb of Bhringraj (*Eclipta alba*), were collected dried under shade and powdered, all powder material passed through the sieve (NO.80), Lohabasma (Herbo mineral) was purchased from local market of Hyderabad.

For all the above materials were studied for their Morphological, Physical (Ash values) and Phyto-chemical identifications and reported.

STEP: I

Collection of plant materials from medicinal plant garden (CBCP) and authenticated

STEP: II

Evaluation of purity and quality of raw materials by morphological, physical and chemical techniques, toxicological 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-VII)

STEP: V

Human white hairs were collected from human voluntaries

STEP: VI

The formulated dye pastes were kept a side for 1h for imbibition and then the white hair samples were kept in the above paste for 30 min, 1 hr ,and 2 hrs then washed with water and observed for its dyeing effect (colour grade),safety parameters, for all formulations.

Formulation:

S. N O	INGRIDIENT	H.H.D I	H.H.D II	H.H.D III	H.H.D IIV	H.H.D V	H.H.D VI	H.H.D VII
1	HENNA	30g	25g	20g	15g	10g	5g	0g
2	INDIGO	0	5g	10g	15g	20g	25g	30g
3	ALOE VERA	2g	2g	2g	2g	2g	2g	2g
4	FEENU	2g	2g	2g	2g	2g	2g	2g
5	BHIRINGRAJ	2g	2g	2g	2g	2g	2g	2g
6	AMLA	2g	2g	2g	2g	2g	2g	2g
7	GUAV	2g	2g	2g	2g	2g	2g	2g
8	BLACK CATECHU	5g	5g	5g	5g	5g	5g	5g
9	TULSI	3g	3g	3g	3g	3g	3g	3g
10	LOHA BHASMA	2g	2g	2g	2g	2g	2g	2g
11	WATER	q.s	q.s	q.s	q.s	q.s	q.s	q.s

(H.H.D-----HERBAL HAIR DYE)



Fig.1. Formulated Hair Dyes H.H.D-I to H.H.D-VII



Fig.2. Formulated Hair Dyes H.H.D-I to H.H.D-VII

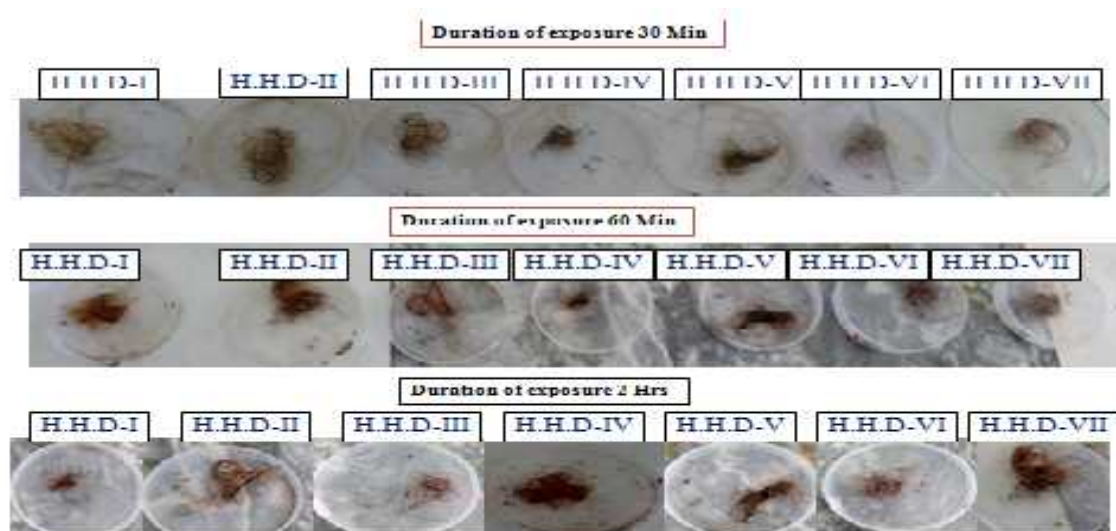


Fig.3.Hair Dyeed Samples after Wash (H.H.D-I to H.H.D-VII)

III.RESULTS:

Evaluation:

Table.1.I-Physical Evaluation (Ash Values)

S.NO	DRUGS	TOTAL ASH	ACID INSOLUBLE ASH	WATER SOLUBLE ASH
1.	Henna	14.60%	4.50%	3.0%
2.	Indigo	40.0%	15.0%	15.0%
3.	Aloevera	0.16±0.02	2.25%	12.5%
4.	Bhringraj	16.1%	8.98%	17.95%
5.	Tulsi	9.2%	5.5%	7.5%
6.	Black catechu	1.16-2%	0.2-0.4%	0.09-0.25%
7.	Guava	3.29%	0.25%	2.83%
8.	Feenu greek	4	0.5	-
9.	Amla	7.5%	8%	2%

Table.2.II-Phytochemical Screening

S.NO	PHYTO-CONSTITUENTS	Henna	Indigo	Fenu greek	Bhringraj	Amla	Black catechu	Tulsi	Aloe Vera	Guava
1	Alkaloids	-	-	-	-	-	-	-	-	+
2	Glycosides	-	-	-	-	+	-	+	+	+
3	Tannins	+	+	-	+	+	+	+	-	-
4	Anthraquinones	+	+	-	+	+	-	+	+	+
5	Carbohydrates	+	+	+	+	+	+	+	+	+
6	Terpenoids	+	+	+	+	+	+	+	-	+
7	Coumarins	+	+	+	+	+	+	+	+	+
8	Flavonoids	+	+	+	+	+	-	+	+	+
9	Saponins	-	-	+	+	+	-	-	+	+

III-Study on Dyeing Effect (Color Grade Scale)



Table.3.IV-Evaluations of Herbal Hair Dye

S.NO	STUDY ON DYEING EFFECT	H.H.D I	H.H.D II	H.H.D III	H.H.D IV	H.H.D V	H.H.D VI	H.H.D VII
1	Physical Appearances	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage
2	Duration of exposure	30 min	30 min	30 min	30 min	30 min	30 min	30 min
3	Coloring effects and fastness property	1/4	1/4	1/4	2/4	3/4	3/4	¾
4	pH	6.12	6.40	6.56	6.69	6.81	6.53	6.83

Table.4

S.NO	STUDY ON DYEING EFFECT	H.H.D I	H.H.D II	H.H.D III	H.H.D IV	H.H.D V	H.H.D VI	H.H.D VII
1	Physical Appearances	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage
2	Duration of exposure	60 min	60 min	60 min	60 min	60 min	60 min	60 min
3	Coloring effects and fastness property	2/4	2/4	2/4	3/4	3/4	3/4	3/4
4	pH	6.12	6.40	6.56	6.69	6.81	6.53	6.83

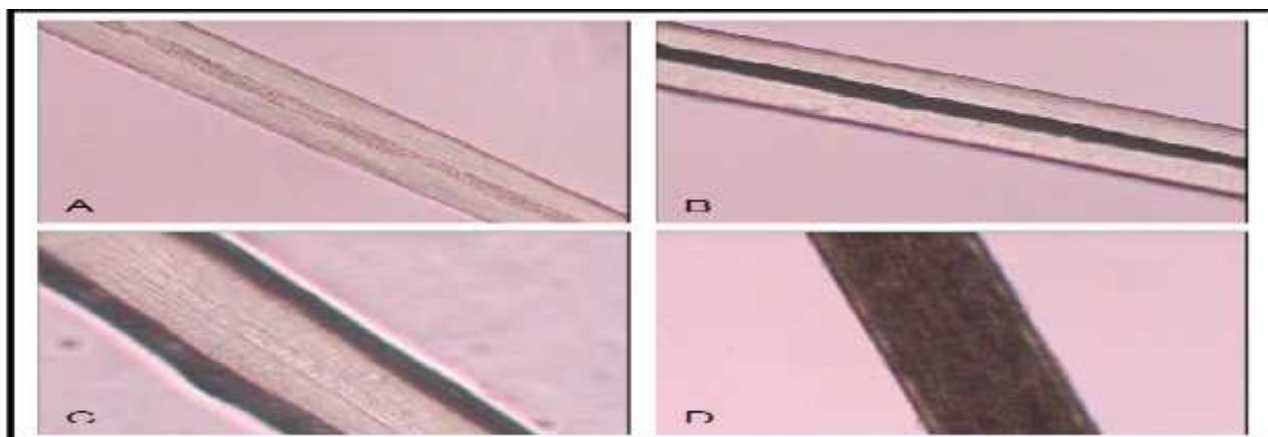
Table.5

S.NO	STUDY ON DYEING EFFECT	H.H.D I	H.H.D II	H.H.D III	H.H.D IV	H.H.D V	H.H.D VI	H.H.D VII
1	Physical Appearances	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage
2	Duration of exposure	60 min	60 min	60 min	60 min	60 min	60 min	60 min
3	Coloring effects and fastness property	3/4	3/4	3/4	4/4	2/4	2/4	2/4
4	pH	6.12	6.40	6.56	6.69	6.81	6.53	6.83

V-Skin Irritation Study: Draize modified scoring technique

Table.6.Observation: No such Allergic reactions and inflammatory symptoms are noticed

S.NO	Draize modified scoring technique	H.H.D I	H.H.D II	H.H.D III	H.H.D IV	H.H.D V	H.H.DVI	H.H.D VII
1	Duration of exposure	2Hrs 6 Days	2Hrs 6 Days	2Hrs 6 Days	2 Hrs 6 Days	2Hrs 6 Days	2 Hrs 6 Days	2 Hrs 6 Days
2	skin sensitivity	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage	No Damage



Microscopic View Of Human Hair

A. Microscopic view of human white Hair treated with formulated Herbal Hair Dyes -30 Min

B. Microscopic view of human white Hair treated with formulated Herbal Hair Dyes-60 Min

C. Microscopic view of human white Hair treated with formulated Herbal Hair Dyes --2 Hours

D. Microscopic view of human white Hair treated with formulated Herbal Hair Dyes formula (H.H.D-IV) (No Damage in all formulations *)

CONCLUSION

It can be concluded from the investigation that by changing the proportion of Henna and Indigo a suitable Black color could be obtained for hair. A pH of 6.69 (H.H.D-IV) 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, erythema formation and edema. It is prepared from 100% 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.

REFERENCE

1. Rangari.D.Vinod, Natural colorants and dye In: Pharmacognosy and Phytochemistry, (1stEd, Vol 1). Career publication, India, 2004, pp98-117.
2. David Mc Junkin, Catherine McLean and Elizabeth C. Welsh, The Laboratory for Historical Colorants at UCLA Laboratory for Historical Colorants, Waac-Newsletter, 13 (3), 1991, 21
3. Agarwal R, Pruthi N and Singh SSJ, Effect of mordants on printing with marigold flower dye, Nat Prod Rad, 2007; 6(4): 300-309.
4. Balsam, M. Aryayev, N. L., Extract of Aloe: Scientific and clinical data. in *Aloe vera: New Scientific Discoveries* by Max B. Skousen. ,1976; 84-93.
5. Nilani Packianathan et al, /J. Pharm. Sci. & Res. Vol.2 (10), 2010, 648-656 655
6. Quality control method for medicinal plant materials-WHO Manual, 2002, AITBS
7. Publication, India, 8-6pp.
8. Mahale G, Sunanda RK and Sakshi, Colour fastness of eco dyed cotton with marigold, Text Trends, 2000; 44 (10): 35-39.