



FORMULATION AND EVALUATION OF ECOFRIENDLY HERBAL BASED HAIR DYE: HAIRCARE PRODUCT

Botany

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ABSTRACT

Most of the human beings are very careful about their beauty and hairs. The age at which graying starts is deeply influenced by heredity. But premature depigmentation in adults is mainly due to variety of other factors, as illness, some specific usage of drugs, shampoo, styling agents etc. Chemical based hair dyes, which cause skin and other skin related diseases, natural herbal dyes are being preferred nowadays. The need of herbal based natural medicines is increasing fastly due to their natural goodness and lack of side effects. Amla, Bhringraj, Henna, Jatamansi, are well - known ayurvedic herbal drugs traditionally used as hair colorant and for hair growth .The increase in environmental and health hazards in the manufacture of dyes and its use throughout world is a major concern. Plants sources can replace the synthetic dyes. Primary healthcare, around 80% of world's population relies on traditional medicines, involving plant extracts. The current research work was aimed at the preparation of herbal hair dye and the evaluation of its various parameters such as organoleptic, physico-chemical, phytoconstituents and patch test.

KEYWORDS

Organoleptic, Physico-chemical, Phytoconstituents and patch test.

INTRODUCTION

Herbal based hair dyes are being preferred on large scale, due to the large number of advantages it exerts to overcome the ill-effects of a chemical-based hair dye. I have attempted to formulate and evaluate this preparation to ensure its quality as well as stability aspects. The herbal hair dye shows permanent dying to the applied regions of human hair without causing any hair damage or hair loss or skin irritation when compared to the synthetic and semi synthetic dyes. The herbals also prevent the hair from damage caused by photoreaction and pollution.

Plants have been used traditionally for their hair coloring, growth promoting and anti-aging properties. As global scenario is now changing towards the use of Safer, nontoxic natural product with traditional use, attempts have been made in the present investigation to develop herbal based hair dye devoid of any chemical, containing few traditionally used herbs. [1]

Manufacturing hazards, environmental pollution, is the side and toxic effects of synthetic dye it need for an alternative to the existing black dye. These limitations of the chemically derived dye can only be overcome by replacing the constituents in the composition, by nontoxic ingredients derived from herbal resources [2]. The black dye produced from herbal resources may be used in wide variety of context including hair color products. At this juncture, there is enormous need for a method to increase the yield of such dyes from herbal products.

METHODOLOGY

Collection of raw materials from medicinal plant garden and authenticated by the Botanist. For the preparation of herbal hair dye, I have selected nine important ingredients such as Henna, Coffee, Tea, Amla, Hibiscus, Bhringraj, Jatamansi, Lemon and Indigofera. Herbals are collected from the herbal garden and authorized stores of the local market. All the herbs were collected and shade dried and coarsely powdered. Then all the ingredients were mixed uniformly to prepare a homogenous formulation.

Application of Hair Dye

Herbal (Hair Pack 1&2) which is in the form of powder, should be used weekly on dry hair, forming a paste of in water with optimum consistency. It should be applied evenly on the hair with the help of a brush, covering the roots to the hair tip. The scalp should be covered. It should be left for 2-3 hours on the scalp for complete drying. Then it should be removed by washing with plain water,

Hair Pack 1:

Desired amount of henna was mixed with same proportion of all other herbals except *intigofera* were added to that in order to make a smooth paste. The paste was kept it in a iron bowl. The hair was kept in above paste for 1 hour. After that it was washed with water and observed for its colouring.

Hair pack 2:

Amla and Indigo were mixed with water to make smooth paste and processed similarly as above to observe colouring.

Evaluation of the Herbal Hair Dye

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

Organoleptic Evaluation [3]

Organoleptic characteristics for various sensory characters like color, taste, odour etc. was carefully noted down. The raw drugs and powders were separately studied by organoleptic and morphological characters like colour, odour, texture and appearance

Physico-Chemical Evaluation[4]

The physical and chemical features of the herbal hair dye were evaluated to determine the pH, its moisture content and its ash value for the purpose of stability, compatibility and the amount of inorganic matter present in it.

Phytochemical Evaluation [5]

Prepared herbal hair dye was subjected to Phytochemical screening to reveal the presence or absence of various phytoconstituents as Carbohydrates, Lipids, Alkaloids, Sugars etc. The formulation when dissolved individually in 5 ml of water and filtered; the filtrates were used to test the presence of carbohydrates. The aqueous extract of the formulated herbal face pack was evaluated for the presence or absence of different phytoconstituents as per the standard procedures and norms

Patch Test[6]

This usually involves dabbing a small amount of the aqueous solution of hair dye behind the ear or on inner elbow in an area of 1sq.cm and leaving it to dry. Signs of irritation or feeling of non wellness is noted, if any. Measured and small quantities of prepared hair pack were applied to the specified area for a fixed time. Irritancy, redness, and swelling were checked and noticed for regular intervals up to 24 hours.

RESULTS AND DISCUSSION

Table 1. Organoleptic evaluation of herbal hair dye.

S.No.	Parameters	Result
1	Colour	Greenish brown
2	appearance	Powder
3	Odour	Characteristic
4	Texture	Fine

Table2. Physico-chemical evaluation of herbal dye.

Medicinal plants	Total ash	Acid insoluble ash	Water soluble ash	PH Values
Henna	12.56%	3%	4%	5
Coffee	3.12%	1%	4.3%	4.9-5
Tea	7.5%	.8%	6.5%	5
Amla	8%	.49%	2%	2.78
Hibiscus	15%	1%	4%	2.5-2.7
Jatamansi	7.78%	2%	5%	3.4
Lemon	17%	3%	4.2%	2.7-3

Indigofera	20%	10%	12%	5.3-6.2
Bringaraj	18%	10%	15.8%	5-6

Table 3. Phytochemical evaluation

S.N O.	PHYTO-CONSTITUENTS	Hen na	Cof fee	Tea	Aml a	Hibis cus	Jatam ansi	Lem on	Indig ofera	Brin graj
1	Carbohydrates	+	+	+	+	+	+	+	+	+
2	Glycosides	+	-	-	-	+	-	-	+	+
3	Tannins	+	+	+	+	+	+	-	+	+
4	Alkaloids	-	-	+	-	-	+	+	+	+
5	Antraquinones	+	-	-	-	+	-	+	+	+
6	Terpenoids	-	-	-	-	-	-	+	+	+
7	Flavonoids	+	+	+	+	+	+	+	+	+
8	Saponins	+	-	-	-	+	-	-	-	+

Table 3. Patch test

S.No	Parameters	Result
1	Swelling	Negative
2	Redness	Negative
3	Irritation	Negative

Plate 1**Sample Hair****Herbals Used For Hair Dye****Hair Dye****Hair Dye Applied On The Hair****Hair After The First Treatment****Hair After The Fifth Treatment**

Herbal based hair dye has been synthesized and evaluated using the various parameters. It offers a natural alternate, which can be used, without any side effects. The prepared herbal hair dye contains all the natural ingredients. Apart from acting as a hair dye, this formulation is perfect blend of herbals, which also acts as a hair growth promoter, hair nourisher, conditioner, anti-dandruff and prevent the premature greying of hair. Organoleptic characteristics for various sensory characters like color, taste, odour etc. was carefully noted down. as illustrated in Table 1 The raw drugs and powders were separately studied by organoleptic and morphological characters like colour, odour, texture and appearance Physico-Chemical Evaluation The physical and chemical features of the herbal hair dye were evaluated to determine the pH, its moisture content and its ash value for the purpose

of stability, compatibility and the amount of inorganic matter present in it. Table 2 reflects the above findings. Phytochemical Evaluation of herbals was subjected to Phytochemical screening to reveal the presence or absence of various phytoconstituents as Carbohydrates, Glycosides, Tannins, Lipids, Alkaloids, Anthraquinones and Terpenoids. The formulation when dissolved individually in 5 ml of water and filtered; the filtrates were used to test the presence of carbohydrates. The aqueous extract of the herbals was evaluated for the presence or absence of different phytoconstituents as per the standard procedures and norms. The results of phytochemical screening are highlighted in Table 3.

Patch Test This usually involves dabbing a small amount of the aqueous solution of hair dye behind the ear or on inner elbow in an area of 1sq.cm and leaving it to dry. Signs of irritation or feeling of non-wellness is noted, if any. Measured and small quantities of prepared hair pack were applied to the specified area for a fixed time. Irritancy, redness, and swelling were checked and noticed for regular intervals up to 24 hours if any. The results of tests for the signs of irritation are displayed in Table 4.

The formulation was kept for one month at room temperature to observe the changes in its color, odour, texture and appearance. The pH was also noticed before and after one month. The formulation was found to be stable. Ash value was found to be nominal, signifying the presence of inorganic radicals in appropriate amounts. It shows the presence of major phytoconstituents, which acts as true nourisher for the scalp as well as hair. Irritancy test revealed negative results for irritancy, redness and swelling as the herbals in their natural form without use of artificial additives were found to be compatible with the proteins of hair.

CONCLUSION

Compared to the chemical-based hair dyes, which cause skin and other skin related diseases, natural herbal dyes are being preferred nowadays. A herbal hair pack colours the hair in an utmost gentle manner. It is a noticeable attempt to formulate the herbal hair pack containing the goodness of powders of different plants, which are excellent for hair care. It can be concluded from the investigation that 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 Environmentally friendly.

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REFERENCES

1. Rangari.D.Vinod, Natural colorants and dye In: Pharmacognosy and Phytochemistry , (1stEd,Vol 1), Career publication,India, 2004,pp 98-117
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. Wallis TE. Text book of Pharmacognosy. 5th Ed.. New Delhi: CBS publishers & distributors, 2002; 123: pp. (132)210-5.
4. Mandeep S, Shalini S, Sukhbir LK, Ram KS, Rajendra J. Preparation and evaluation of herbal cosmetic cream. Pharmacologyonline 2011; 1258-64
5. Pal RS, Pal Y, Wal P. In-house preparation and standardization of herbal face pack. Open Dermatol J 2017; 11: 72-80. [http://dx.doi.org/10.2174/1874372201711010072]
6. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. 42nd ed.. Pune: India: Nirali Prakashan 2008; 6: pp. 1-A1.