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## DEVELOPMENT AND EVALUATION OF NATURAL HAIR BOOSTER OILS

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### ABSTRACT

The main intent is to explore the natural herbs by formulating polyherbal hair oil as a synergistic approach for the treatment of indefinite hair problems. The various herbal ingredients are used in the formulation are coconut oil, lavender oil, almond oil, grapeseed oil, rosemary oil, aloe vera gel, vitamin E, multivitamin and serine.

The present work was aimed to formulate herbal hair booster oil for application in hairs using herbal oils in various concentrations and was found to have optimum standards. All the values in the evaluation of finished product showed that they are within the acceptable limits. Hence, it is concluded that the formulated oils are beneficial in maintaining good growth of hairs, turning gray hairs to black, providing protection from dandruff and may results in lustrous hairs.

**Keywords: Natural booster, alopecia, polyherbal oils, cosmeceutical**

## INTRODUCTION

Hair grows everywhere on the human skin except on the palms of our hands and the soles of our feet, but many hairs are so fine they're virtually invisible. Hair is made up of a protein called keratin that is produced in hair follicles in the outer layer of skin. As follicles produce new hair cells, old cells are being pushed out through the surface of the skin at the rate of about six inches a year. The average adult head has about 100,000 to 150,000 hairs and loses up to 100 of them a day; finding a few stray hairs on your hairbrush is not necessarily cause for alarm [1, 2].

At any one time, about 90% of the hair on a person's scalp is growing. Each follicle has its own life cycle that can be influenced by age, disease, and a wide variety of other factors. As people age, their rate of hair growth slows. Approximately 35 million men and 21 million women suffer from hair loss. Beginning at age 35 with a 40% loss rate for men and growing to a 70% loss rate for men age 80. By age 60, women hair loss sufferers will be in the 80% range [3, 4, 5].

The causes of hair loss includes several factors such as hormones, genes, stress, drugs, autoimmune diseases, cosmetic procedures, medical conditions, diet, burns, injuries and X-rays. Signs and symptoms of hair loss may include gradual thinning on top of head, circular or patchy bald spots, sudden loosening of hair, full-body hair

loss and patches of scaling that spread over the scalp. Diagnosis for hair fall incorporates blood test, pull test, scalp biopsy and light microscopy. The current treatment embraces on medications such as Minoxidil, Finasteride, Dutasteride, Oral contraceptives and spironolactone; Hair transplant surgery and laser therapy; Lifestyle and home remedies [6, 7].

The traditional system of medicine in India acclaims a number of herbal drugs for hair growth promotion. Compared with commercial cosmeceuticals the herbo – cosmeceutical preparation is more potent, safe, enhanced activity and without any side effects [8, 9].

So the present work is aimed to develop the herbo - cosmeceutical formulations for hair growth promoting activity. The various herbal ingredients are used in the formulation are coconut oil, lavender oil, almond oil, grapeseed oil, rosemary oil, aloe vera gel, vitamin E, multivitamin and serine [10, 11, 12].

## MATERIALS AND METHODS

For the preparation of herbal hair booster oils various ingredients were purchased viz., coconut oil, lavender oil, almond oil, grape seed oil, rosemary oil, aloe vera gel, vitamin E, multivitamin and serine from the local market and was properly authenticated in the Department of Pharmacognosy.

Table 1: Formulation of Natural Hair Booster Oils [13, 14]

MASTER FORMULA	FORMULA	METHOD OF PREPARATION
F1	Coconut oil - 20 ml Almond oil - 10 ml Aloe vera gel - 2 gm Lavender oil - 2-3 drops Vitamin E - q.s	Take 20 ml of coconut oil in clean beaker then add 10 ml of almond oil. Take 2 gm of aloe vera gel in another beaker then add Vitamin E quantity sufficient. Add gel mixture into oil mixture. Stir the mixture continuously till the gel gets completely dissolve add lavender oil 2-3 drops. Transfer the mixture into a transparent container
F2	Coconut oil - 20 ml Almond oil - 10 ml Aloe vera gel - 1 gm Multi-vitamin - q.s	Measure 20 ml coconut oil and transfer into a clean beaker. Here coconut oil acts as base. Similarly measure 10 ml almond oil and 1 gm of aloe vera gel and transfer into another beaker. Stir continuously till gel phase dissolve in oil phase. Transfer the mixture into base. Multi-vitamin is added as required. Multi-vitamin is prepared by placing zinc, magnesium turnings and sulphur in mortar and crush them to make powder. Sieve the powder to obtain homogenous particles of powder. This powder is mixed with little amount of coconut oil. Filter the mixture and filtrate is taken as multi-vitamin solution
F3	Coconut oil - 20 ml Grape seed oil - 5 ml Rosemary oil - 5 ml Vitamin E - 2 capsules Lavender oil - 2-3 drops Serine - q.s	Measure 20 ml of coconut oil which act as base transfer into a clean beaker. Similarly measure 5 ml of grape seed oil, 5 ml of rosemary oil and transfer into another beaker and add 2 vitamin E capsules. Stir the mixture and transfer into coconut oil. Then add lavender oil 2-3 drops and serine as sufficient to the mixture. Stir the mixture and transfer into container
F4	Coconut oil - 10 ml Neem extract - 5 ml Grape seed oil - 5 ml Almond oil - 5 ml Serine - q.s	Firstly neem leaves was washed throughly and dried. Neem leaves were crushed and coconut oil is added this mixture is subjected to boil till the leaves colour turned brown. Filter the mixture and filtrate is taken as neem extract. Measure 10 ml of coconut oil and 5 ml of neem extract transfer to a clean beaker. This solution is act as base solution. Similarly measure 5 ml grapeseed oil and 5 ml of almond oil and transfer into another beaker. This solution is transferred to base solution and serine is added as sufficient required. Stir the mixture and transfer to a container
F5	Coconut oil - 10 ml Neem extract oil - 5 ml Almond oil - 5 ml Grapeseed oil - 5 ml Rosemary oil - 5 ml Multi-vitamin - q.s	Measure 10 ml of coconut oil and 5 ml of neem extract and transfer into a clean beaker. This solution is act as solvent. Similarly measure 5 ml of almond oil, 5 ml of grapeseed oil and 5 ml of rosemary oil into another beaker. This mixture is added to base solution. Then add multi-vitamin as required. Stir the mixture and transfer to a container

## Evaluation of Herbal Hair Oils

### 1. Sensitivity Test:

The prepared herbal hair oil was applied on 1 cm skin of hand and exposed to sunlight for 4-5 min.

### 2. Acid Value:

#### Preparation of 0.1 molar solution:

Weighed 0.56 g KOH pellets and dissolved in 100 mL of distilled water and stirred continuously. The prepared 0.1 molar KOH solution was filled in the burette.

**Preparation of sample:** 10 mL oil was measured and dissolved in 50 mL of 1:1 ethanol and ether mixture and shaken vigorously. 1 mL of phenolphthalein solution was then added and titrated with 0.1 molar KOH solution.

3. **Saponification Value:** To accurately weighed 1 mL of oil in a 250 mL of conical flask, 10 mL of ethanol: ether mixture (2: 1) was added. To this, 25 mL of 0.5 N alcoholic KOH was added and was kept undisturbed for 30 min. and the flask was cooled. This solution was titrated against 0.5 N HCl using phenolphthalein indicator. Similarly, the blank titration was performed without taking oil (sample). Amount of KOH in mg used was calculated using formula,

$$\text{Saponification Value} = \frac{56.1(B-S)}{N/W}$$

Where, B= Volume in mL of standard Hydrochloric acid required for the blank. S= Volume in mL of standard Hydrochloric acid required for the sample. N= Normality of standard Hydrochloric acid. W= Weight of the oil taken in gms for the test.

4. **pH:** The pH of herbal hair oil was determined using pH meter.
5. **Viscosity:** The viscosity was determined using Ostwald's viscometer.
6. **Specific Gravity:** Specific gravity bottle was rinsed with distilled water, dried in hot air oven for 15 minutes, cooled, capped, weighed and was noted as (a). Now the same specific gravity bottle was filled with the sample, capped and again weighed (b). Weight of the sample per milliliter was determined by subtracting the weights (b-a).
7. **Irritation test:** Apply the prepared herbal hair oil sample on hand and leave for few minutes.
8. **Grittiness test:** The prepared herbal hair oil sample was tested to see any other uncountable particles are present in the sample or to test the smoothness of the formulation [15, 16].

**RESULTS AND DISCUSSION**

**Pre Formulation Studies**

The color, odor, taste, appearance are organoleptic properties of natural hair booster oil were observed and noted in the Table 2.

**Development of Natural Hair Booster Oils**

The five natural hair booster oils were formulated by using different oils in

various concentrations based on importance and traditional claims. Coconut oil was used as a base. The formulated oils were preserved in a well closed containers and labelled.

**Post Formulation Parameters (Table 3)**

Results of post formulation parameters can be seen in Table 3.

Table 2: Organoleptic Characters

Materials	Parameters			
	Color	Odor	Taste	Appearance
Coconut oil	Colorless	Typical odor	Sweet	Liquid
Almond oil	Clear, Light yellow	Faint nutty	Sweet	Liquid
Grape seed oil	Clear to yellowish green tinge	Faint, slightly sweet and nutty	Neutral	Liquid
Lavender oil	Clear	Light fresh and floral	Aromatic	Liquid
Rosemary oil	Deep green	Richly aromatic	Savory	Liquid
Aloevera gel	Clear	Odourless	Bitter	Thin shiny gel
Vitamin E	Transparent	Faint odour	Tasteless	Liquid
Multi vitamin	Black & white	Odorless	Tasteless	Crystalline powder
Amino acid(serine)	White	Faint musty aroma	Sweet and slightly sore	Powder
Neem extract	Green	Pungent	Bitter	Liquid

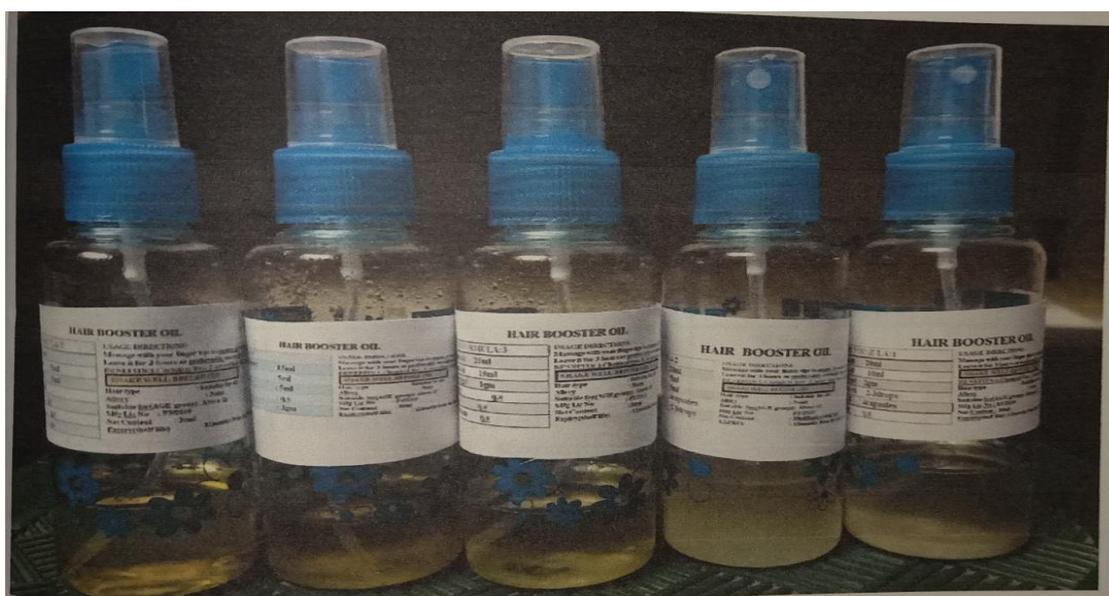


Figure 1: five natural hair booster oils were formulated

Table 3: Specific gravity, pH, Viscosity, Acid value:

Formulation code	Specific gravity (g/ml)	pH	Viscosity	Acid value
Master Formula [F1]	0.91	4.8	0.318 cp	1.1
Master Formula [F2]	0.925	5.0	0.326 cp	1.4
Master Formula [F3]	0.917	4.9	0.226 cp	0.5
Master Formula [F4]	0.924	5.1	0.22 cp	0.4
Master Formula [F5]	0.921	5.3	0.238 cp	0.91

Table 4: Sensitivity test, Grittiness test, Irritation test, Saponification value

Formulation code	Sensitivity Test	Irritation Test	Grittiness Test	Saponification Value
Master Formula [F1]	No irritation	No irritation	Smooth	220
Master Formula [F2]	Slight	Slight	Smooth	240
Master Formula [F3]	No irritation	No irritation	Smooth	198
Master Formula [F4]	Mild irritation	Mild burning Sensation	Smooth	210
Master Formula [F5]	Mild irritation	Mild burning sensation	Smooth	215

## DISCUSSION

The specific gravity, pH, viscosity, saponification value, acid value, irritation, sensitivity, grittiness tests of the natural hair booster oils are performed.

There was no irritation and grittiness found in the formulated oils and the oils were smooth in nature.

The sensitivity test varies with the skin even though no irritation on the skin was observed.

The specific gravity of the natural hair booster oils are performed using specific gravity bottle and it was observed that the values are noted in the **Table 3**.

Viscosity of the formulated natural hair booster oils was studied by using Ostwald viscometer and values observed are noted in the table.

The pH of the natural hair booster oils was performed using pH meter. The pH of the oils should be in the range of pH of hair scalp that is 4.5 to 5.5.

The saponification value of the natural hair booster oils was performed, evaluated and the values are noted in the **Table 4**.

## CONCLUSION

There is a tremendous clamor for the herbal cosmeceutical individual care or personal health care industry, which is presently focusing and paying extra diligence on the development of herbal-based cosmetics. As nowadays, it is a fast developing segment with a mammoth scope of manifold boost in coming years. Use of bioactive ingredients in cosmetic formulations have valuable effect on body features and provide nutrients, which are essential for maintaining healthy and beautiful hairs.

The traditional system of medicine in India acclaims a number of herbal drugs for hair growth promotion. Compared with commercial cosmeceuticals the herbo – cosmeceutical preparation is more potent, safe, enhanced activity and without any side effects. In general, herbal formulation

provides good blend of vitamins, antioxidants, terpenoids, and essential oils.

The Natural hair booster oil was prepared from various herbal oils which contains numerous essential nutrients required to maintain normal function of sebaceous glands and promotes natural hair growth. The various parameters like sensitivity test, viscosity, pH, irritation test, grittiness test, saponification value and acid value of natural hair booster oils were evaluated.

All the values in the evaluation of finished product showed that they are within the acceptable limits and maintain optimum standards. At last it can be concluded that, this herbal hair oil formulation has significant quality. Further scope of the study is standardization and biological screening which establishes the efficacy of formulated natural hair booster oils.

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