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Herbal hair dye oil formulation and characterization

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Abstract:

Hair fall is a very common phenomenon and a matter of concern within whatever young or aged. Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with synthetic drugs. The synthetic drug have some side effects like local irritation, itching and burning sensation. Herbal cosmetics are now-a-days widely used by the common people because of concept of fewer side effects and with a better safety and security profile. The objective of present study involves preparation of polyherbal hair oil using herbs like Amla, Hibiscus, Brahmi, Methi, Bringraj, Neem leaves, curry leaves, and its evaluation for increase in hair growth activity and physical parameter were also evaluated like viscosity, refractive index, specific gravity, pH, acid value, saponification value etc. and were compared with some synthetic marketed formulations. To find out the efficacy of test herbal hair oil over simple Coconut Oil (purified) to reduce the hair falls.

Keyword: Hair fall, hair dye oil, Herbs, physical parameters.

Introduction:

Cosmetics are substances used to enhance the appearance or odor of the human body. Cosmetics include skin-care creams, lotions, powders, perfumes, lipsticks, fingernail and toe nail polish and facial makeup, permanent waves, colored contact lenses, hair colors, hair sprays and gels, deodorants, baby products, bath oils, bubble baths, bath salts, butters and many other types of products. A subset of cosmetics is called "Make-up", which refers primarily to colored products intended to alter the user's appearance. Many manufacturers distinguish between decorative cosmetics and care cosmetics. In the last three-four decades the use of cosmetics has increased exponentially not only among females but the male population also indulges in their use. Hair dyes, hair oil, creams are as popular with males as with females. Most countries now have laws to control, manufacturing, label, sale etc. of cosmetics in such a way that use of cosmetics harmful to health is prevented. The concept of beauty and cosmetics is as ancient as mankind and civilization. So, they use various beauty products that have herbs to look charming and young. Indian herbs and its significance are popular worldwide. Herbal cosmetics have growing demand in the world market and are an invaluable gift of nature. There is wide range of herbal cosmetic products to satisfy beauty regime. Adding herbs in cosmetics are very safe to our skin. Herbal hair oils are one of the most well recognized hair treatments. Herbal hair oil not only moisturizes scalp but also reverses dry scalp and dry hair condition. It provides numerous essential nutrients required to maintain normal functions of sebaceous gland and promote natural hair growth.

Factors affecting hair growth

1. Hormonal
2. Nutrition
3. Temperature
4. Age
5. Exogenous chemical

1. Hormonal

Hormonal effects on hair growth are exhibited in various ways including Changes in the onset and duration of anagen, in the rate of growth and thickness of hair during anagen. In the length of telogen and in the release of club hairs. The responses in hair growth obtained by removal of endocrine glands and /or systemic administration of hormones also vary from species to species.

The follicle changes involved in seasonal moulting, which have been shown by various workers to be *photoperiodic* in origin and related to the reproductive cycle, *are* considered to be *mediated via the neuroendocrine* system, particularly in wild or primitive species. Photoperiodism is also involved in the seasonal shedding of hair by domestic species, e.g., nonequational breeds of cattle, and in the annual rhythm of wool growth in improved breeds of sheep.

2. Nutrition

A low plane of nutrition has been found to delay the seasonal shedding in cattle and retards the sub-adult and adult moults in voles. In non-shedding sheep, e.g. Merino, the effects of plane of nutrition are many and varied.. Poor nutrition can reduce follicle initiation and development in the fetus, impair postnatal follicle maturation in lambs, and depress fleece weight, fiber length and fiber thickness in adult animals. However, the nutrition has to be extremely poor before catagen and telogen can be induced nutritionally in follicles in adult sheep. The protein, amino acid, carbohydrate, fat, vitamin and mineral contents of the diet can also affect hair and wool growth in a variety of ways, depending on whether there is an excess or a deficiency.

3. Temperature

Temperature has modifying effects on seasonal molting. Low temperature delays the spring moult in some wild species, appears to be required for the growth of a white winter coat by the mountain hare, increases the density of the winter pelage of wild species and the depth of the winter coat of cattle and may stimulate the wool growth of shorn sheep.

4. Age

The effect of increase in age on the pelage of various wild species has been reviewed by Ling (1970). The establishment of the adult pelage in some species requires several moults, and sometimes one of these moults may be omitted by animals born late in the breeding season. With increasing age the patterns of the adult moults change. Likewise in the mouse the successive hair waves change in pattern and becomes less frequent with age. In non shedding sheep, fleece weights are heaviest at ca. 3 Vs years of age and subsequently decline together with fiber length, while fiber thickness increases with age. Also deterioration of staple crimp occurs in an increasing proportion of older sheep, due to abnormal cell proliferation and cyst formation in the proximal outer root sheath of the follicles.

5. Exogenous chemical

Among the most noticeable effects on hair growth produced by a variety of exogenous chemicals are alopecia and change in pigmentation. Attempts have been made to utilize chemically induced hair loss for the biological harvesting of wool and for epilating Angora rabbits.

HAIR OIL

Hair oils are the hair care preparations used for the prevention and treatment of baldness or other ailments, aggression of hair. They also promote the luxurious growth of hairs. Hair oil containing herbal drugs are used as hair tonic. Hair care products are categorized into two main category, hair tonics and hair grooming aids. These are basically the extracts of medicinal plants in an oil base. A plethora of herbs have been employed for hair treatments. A few of these herbs are amla, Henna, Neem, Methi, Lemon, Tulsi, Brahmi, Shikakai, Reetha, Mahabhringraj, Jantamasi, marigold, hibiscus, nutmeg, parsley, rosemary, thyme. Synthetic drug, minoxidil is a potent vasodilator appears safe for long-term treatment. After five years use of 2 and 3% topical minoxidil, the improvement has been shown to peak at one year with a slow decline in regrowth over subsequent years.. Long-term treatment with local

side effects may be a problem with continuing use of minoxidil lotion. On the basis of market survey carried out on crude drugs used presently for herbal hair oils gives us clue for selection of drugs for hair oil. Hence the present study was aimed to evaluate the hair growth activity of herbal formulations, which includes oil extract of all mentioned drugs in various concentrations. In order to justify the traditional claims now a day's multi ingredient hair oils are prepared and tested for their hair growth activity. Amla is rich in vitamin C, tannins and minerals such as phosphorus, iron and calcium which provides nutrition to hair and also causes darkening of hair. Hibiscus consists of calcium, phosphorus, iron, vitamin B1, riboflavin, niacin and vitamin C, used to stimulate thicker hair growth and prevents premature graying of hair. Brahmi contains alkaloids which enhance protein kinase activity. Methi contains high protein fodder which supply required protein nutrition to hair. There are various methods available for the preparation of hair oils direct boiling method, paste method and cloth method. After preparation second main step is evaluation of preparation. The next final step is determination of its therapeutic efficacy.

Herbal hair oil

Hair is important part of our body and it influences the overall appearance of the individual. Hair care products are defined as those formulations which are used for cleansing, changing the texture of hair, changing the color, giving life to the stressed hair, providing nourishment to the hair and giving the healthy appearance to the hair. There are two categories of hair care products; they are hair tonics and hair grooming aids. Hair oil which contains herbal drugs are called as hair tonics. These are formulated by herbal extracts in an oil base. Hair oils are the hair care formulations applied for treatment of hair disorders such as baldness, aggression of hair, discoloring of hair, hair falling, and dryness of hair *etc.* The nature of oil is non sticky and addition of perfumes enhances the fragrance and overall improves its popularity. Proper application of hair oil gives luster to hair, softening the hair, gives flowness to hair and more important gives cooling effect to brain. The most recognized hair care preparation is herbal hair oils, they moisturizes the scalp and also helpful in dry scalp and dry hairs. Herbal hair oil maintains normal functions of sebaceous gland as they supply normal essential elements for hair to naturally grow.

Global status of herbal hair oil

According to World Health Organization (WHO) the global herbal market will grow \$5 trillion by 2050. The News National from Nigeria Natural Medicine Development Agency (NNMDA) has projected hope that herbal market currently is \$160 billion globally annually. Next to the China India is the largest producer of medicinal plants having greater than 40 % global diversity. Form the study on 'Herbal Industry Biz Potential', presently, the Indian herbal market is worth Rs 7,000 crore (\$1.7 billion) and India exports herbal raw materials and medicines worth over Rs 3,600 crore (\$902 million).

Material Methodology:

1. Collection and preservation of materials:

For the preparation of herbal hair oil various plant materials were collected powder of Neem, Amla, Shankhpushpi, Brahmi, Bhringraj, Jatamansi, Nirgundi, Shatavari from local market of Islampur.

2. Methods used for preparation of herbal hair oil

The coconut oil is blended with various drugs which have medicinal activity then it is termed as hair oil. It is prepared by the following mentioned processes.

i) **Cloth method:** The dried drug was weighed and tied in a muslin cloth. This cloth was then hanged in coconut oil base, with continuous boiling, stirring and finally the oil was filtered.

ii) **Paste Method:** Paste method was used where fresh fruit or pulp or the desired part of the plants were converted into paste with very little amount of water and kept overnight After this the wetted drug was mixed in coconut oil base and boiled with continuous stirring at a constant temperature, until the water droplets in oil stop knocking and the drug has completely extracted in the oil. The Oil was then filtered through a muslin cloth.

iii) **Direct Boiling Method:** The crude drugs were powdered, weighed and directly boiled in coconut oil with continuous stirring and heating until the drug had completely extracted in the oil base. Procedure followed for the preparation of polyherbal hair tonic.

3. Experimental:

- i. **Collection of crude drugs:** Crude drugs of Neem, Hibiscus, Eclipta, Amla, aloe vera, methi, camphor, curry leaves, were collected from local area.
- ii. **Drying of crude drugs:** Crude drugs were dried under shade and proper aeration is provided in order to hasten the drying process. Drying under shade will retain the active constituents. Hence shade drying is preferred over artificial drying.
- iii. **Mixing and blending of dried crude drugs:** The dried crude drugs were made into coarse powder by using mixer. Later on all these coarsely powdered drugs are passed through mesh number 80. Thus obtained powders are blended individually to get a uniform mixture.
- iv. **Formulating herbal hair Dye oil:** Pure coconut oil extracted from *cocos nucifera* is used. Initially the oil is heated under low flame. To this hot oil, crude drugs in required quantities were added by taking them in a muslin cloth. The crude drug mixture present in muslin cloth is dipped in hot oil. The process is continued by taking the cloth in and out of hot coconut oil under low flame. Thus the active ingredients of the crude drugs will get absorbed into the hot coconut oil. Later the hot oil is cooled and any traces of crude drug powders are removed by filtration process. Initially the oil is brown in colour. On standing of crude oil under cool place for a week turns the colour of the oil to pale green.
- v. **Packing of herbal hair Dye oil:** The oil has pleasant smell with rejuvenating activity for hair growth. The prepared hair oil is completely obtained from natural drugs so it has no side effects and has promising results. It is packed in amber colored bottles and sealed tightly. Then the bottles are sealed in air tight bottles.
- vi. **Storage of herbal hair Dye oil:** The sealed bottles are stored under cool conditions. This keeps the oil stable for longer period of time without undergoing rancidity or saponification.









4. Formulation and Evaluation:

The various ingredients used in the formulations of herbal oil are presented in following table. Accurately weigh all the dried and fresh herbs such as Neem, Amla, Shankhpushpi, Brahmi, Bhringraj, Jatamansi, Nirgundi, Shatavari, Gammhari, Kapur and Pudina were grinded in the mixture and were mixed in 63% of til oil. The above content was boiled for 15 min and was filtered through the muslin cloth. To the filtrate coconut oil was added to make-up the volume (100 ml). Finally small amount of color and flavoring agent was added to oil and it was placed in amber colored bottle.

Ingredients used for the preparation of hair dye oil:

Sr No	Ingredients	Quantity(gm)
1	Amla	50
2	Nirgundi	2
3	Bhringraj	10
4	Brahmi	7
5	Kapur	1
6	Coconut oil	100
7	Indigo	5
8	Shikakai	5
9	Jatamansi	3
10	Neem	2.5
11	Curry leaves	35

Table no 1

Amla	Bhringraj	Brahmi	Indigo
			
Shikakai	Jatamansi	Neem Leaves	Curry Leaves
			

Evaluation :

The formulated herbal oil was subjected to physical and biological evaluation by performing following tests:

a. Sensitivity Test :

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

b. Acid value : Preparation of 0.1 M solution (weighed 0.56 gm KOH pellets and dissolved in 100 ml of distilled water and stirred continuously). The prepared 0.1 molar KOH solution was filled in burette. Preparation of sample: Measured 10 ml oil and dissolved in 25ml of ethanol and 25ml of ether mixture and shaken. Added 1ml phenolphthalein indicator and titrated with 0.1 molar KOH solution.

c. Saponification value : Accurately weighed 1ml of oil into 250 ml of conical flask and 10 ml of ethanol: ether mixture (2:1) was added. To this flask 25 ml of 0.5 N alcoholic KOH was added. Flask is kept for 30 min, and then the flask was cooled. The cooled solution was titrated against 0.5N HCl using Phenolphthalein indicator. Similarly the blank titration was performed without taking oil(sample). Amount of KOH in mg used was calculated.

d. pH: The pH of herbal hair oil was determined by using Digital pH meter.

e. Viscosity: The viscosity was determined using oswald's viscometer.

Result and Discussion:

Sr No	Parameters	Observation of Hair dye Oil
1	Viscosity	0.9
2	Acid value	4.5
3	Saponification value	115.05
4	pH	6.8
5	Sensitivity test	No irritation
6	Irritation test	No irritation
7	Grittiness	Smooth

Table no 2

Conclusion:

The herbal hair oil was prepared and evaluated by using various parameter like, Specific gravity, pH ,Acid value , Saponification value, Viscosity, Refractive index and it is within prescribe limit and hence it may be useful in various hair problem like hair loss, dandruff etc.

Discussion:

The Herbal Hair Dye oil Formulation was formulated with the optimized formula and evaluated for various parameters like color, viscosity, specific gravity, pH, acid value and saponification value, refractive index. The prepared formulation is green to greenish-black in color with pH in accordance with human skin neutral to slightly acidic. The results obtained for physical parameters like specific gravity, PH, acid value, Saponification value are to the similar marketed found to be preparations. The herbal hair oil was prepared from various herbs and their importance in the formulation is presented in above table. Hence, the present investigation it was found that the formulated herbal hair oil has optimum standards and further standerzization and boiological screenings establishes the efficacy of formulated herbal hair oil.

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