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Research Paper

To Study the Formulation and Evaluation of Herbal Hair Oil

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ABSTRACT

This investigation examines the development and assessment of a herbal hair oil composition that utilizes natural components recognized for their advantageous properties on hair wellness. The research incorporates Aloe vera, Tulsi (Ocimum sanctum), Hibiscus (Rosa sinensis), Shikakai (Acacia concinna), Methi (Trigonella foenum-graecum), along with Almond and Coconut oils& Rose, these botanical elements are conventionally esteemed for their capacity to provide scalp nutrition, reduce hair loss, stimulate follicular growth, and enhance hair condition. The methodology encompassed extracting bioactive compounds through suitable techniques before combining them with a foundation of almond and coconut oils. The resultant herbal formulation underwent comprehensive evaluation including organoleptic analysis, pH determination, viscosity measurement, refractive index testing, and stability assessment. Findings indicated that the preparation exhibits favorable physicochemical attributes and potential efficacy for promoting hair growth without synthetic components. This research underscores the importance of integrating multiple herbal ingredients to create an effective natural solution for hair care.

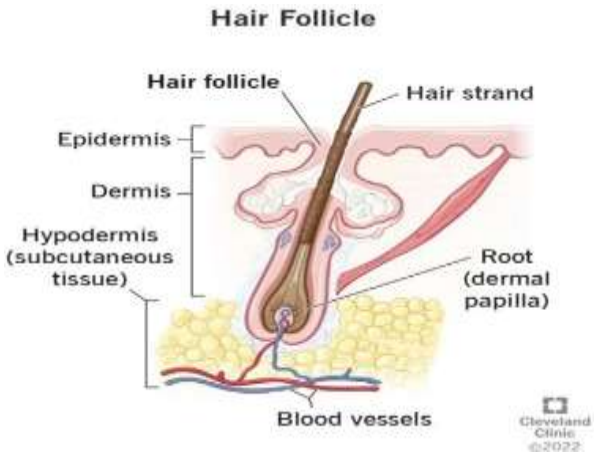
INTRODUCTION

Hair oils are the hair care preparations used for the prevention and treatment of baldness and other ailments. 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. Hair plays an important role in human life. In India the traditional process is the preparation of hair oils put together with various hair growth promoting drugs. Indian women are known for their long, shiny and healthy hair, so it is not surprising that hair care features prominently in their self-care rituals. The Charaka Samhitha (the definitive book on Ayurvedic medicine) describes the importance of oiling the hair and scalp to maintain good hair

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health and prevent hair loss. The daily hair oiling was recommended with appropriate herbs filled to suit others constituents and this practice also continuous until today. The hair oil preparations are included to treat various dandruff, hair fall process, split ends etc. The hair oil preparations are mainly used to cool the scalp for luxurious growth of hair in both men and women. The major problems associated with hair grooming are reduced pigmentation and greying, split ends, dandruff and falling of hair (Adhirajan et al., 2001) [1] leading to premature balding. Multiple factors including genetic predisposition, hormones, environmental exposure, medications, and nutrition predominantly contribute to hair loss (Hosking et al., 2018). Certain pathological conditions, use of chemotherapeutic agents and dermatological disorders can also cause hair fall (Madnani and Khan 2013). Various synthetic formulation ns such as Finasteride and Minoxidil, a vasodilator medication known for its ability to slow or stop hair loss and promote hair regrowth are widely used for treatment of alopecia but do not cure the condition permanently. Pharmacological approaches based on such drugs have limited potential considering the side effects such as allergic reactions associated with them (Satish et al., 2015) . For this reason, the attention has been recently focused on the discovery of new and safer remedies, often exhibited by natural products. It is therefore necessary to discover natural remedies with hair growth promoting potential to replace the synthetic one with hair tonics of plant origin for the treatment of alopecia. Applying oil to the scalp and hair before bath is a regular practice in India to enhance lubrication and maintain hair health. Fregonesi et al. (2009) [24] analysed oils derived from various natural sources and observed that oil treatment reduced the combing force percentage and the formation of split ends in the hair. Hair oils also facilitate scalp treatments and control of alopecia (Maria, 2015) Herbal cosmetic are highly used due to their less adverse effects and the ingredients used are easily available. Hair is one of the vital parts of the body considered to be protective appendages on the body and accessory structure of the integument along with sebaceous glands, sweat glands and nails. The basic part of hair is bulb (a swelling at the base which originates from the dermis), root (which is the hair lying beneath the skin surface), shaft (which is the hair above the skin surface) Hair loss is a dermatologic disorder, and the surge for discovering natural products with hair growth promoting potential is continuous. Each hair. Grows in three cyclic phases' viz., anagen (growth), catagen (involution) and telogen (rest). Hair Is made up of two structures: - Hair follicle Hair follicles are structures within your skin that grow your hair. You're born with millions of hair follicles in your skin. You can't pull out hair follicles. Damaged hair follicles lead to hair loss or reduced hair growt

Hair follicle



The hair follicle is where hair begins to grow and where it is held in place. It is a stocking like structure that starts in the epidermis. It extends to the dermis. The follicle is lined by an inner and outer sheath that protects and molds the growing hair and ends just before the opening of sebaceous gland.

Hair shaft:

The hair shaft is the part of the hair that is made up of three layers of keratin. Those layers are; -

a. The inner layer: - Also called as medulla. Depending on type of hair, the medulla is not always present.
b. The middle layer: - This is called the cortex which makes the majority of the hair shaft.
c. The outer layer: - Also called as cuticle, which is formed by tightly packed scales in an overlapping structure that resemble roof shingle

Hair types:

Hair type is primarily based on hair's curl pattern. The amount of curl in the hair is determined by hair follicle. Hair type is determined by genetics. Andre walker, known for decades as Oprah winfreys stylist, is credited with devising a system that classifies hair according to one of four curl

Type 1: - Straight
Type 2: - Wavy
Type 3: - Curly
Type 4: - Coily

Hair growth cycle:



Hair growth cycle consists of 3 stages: [8].

a. Anagen phase: The hair grows during the anagen phase. The duration of the anagen phase is two to six years. The newly grown hair that has ceased growing is forced out of the follicle by a fresh hair.
b. Catagen phase: 3% of all hairs are in this transitional stage at any given moment, which is known as the catagen phase. This stage lasts two to three weeks.
c. Telogen phase: This two to three month resting phase is known as the telogen phase. The hair follicle is at rest and the club hair is fully developed during the telogen phase

Hair oil:

Hair care products include hair oil. Hair care products are characterised as compositions intended to cleanse, alter the texture of hair, nourish the hair, and preserve the appearance of healthy hair [9]. Hair oil is a hair care product that is applied to the hair to treat conditions like baldness, greying hair, hair loss, and dry hair. It also helps to nourish the hair [10]. Due to the growing interest in herbal cosmetics among people, as well as the fact that they are more effective and have minimal side effects thanks to readily available ingredients, herbal cosmetics are in high demand [11]. Herbal hair oil is an Essential part of herbal cosmetics. Herbal hair oil is more preferred and used in Many aliments of hair. [12] They not only promote hair growth but also provide Necessary moisture to the scalp rendering in beautiful hair. [12] Herbal oil which Contain herbal drugs are known as hair tonic. Hair tonics are herbal oils that include herbal medications [13]. Herbal hair oil provides a number of essential nutrients which are important to maintain the normal function of sebaceous gland and promote natural growth of hair [14]. These are one of the most well recognized product for the treatment of hair [15]. The use of hair oil is growing daily in tandem with people's rising standards of living. Herbal essences and perfumes are added to hair oil to give it natural flavours and colours.

Hair oil should have the following properties:

1.They should give luster to the hair.
2.Retain them soft and flowing.
3.Keep the brain cool. Should not be sticky.

Benefit of hair oil:

- Promote the hair growth thickness of hair.
- For Longer and stronger hair
- Maintaining the health of your hair.
- Maintaining the colour of your hair.
- It stimulates hair growth.
- Improves hair growth.
- Prevents dandruff
- Offers shine glow.
- Stress relief.

Plant Profile

a. Aloe Vera:

Aloe Vera pulp includes proteolytic enzymes which repairs dead skin cells on the scalp. It also work as a great conditioner and leaves your hair all smooth and shiny. It promotes hair growth, prevents itching on the scalp, reduces dandruff and conditions your hair.



Fig.1: Aloe vera

Table 1: Taxonomy of Aloe Ver

Kingdom	Plantae
Family	Liliaceae
Genus	Aloe
Order	Asparagales
Species	A. vera
Biological name	Aloe vera
Other name	Ghritkumari
Uses	Hair growth Promoting healthy cell

Tulsi:

A powerful treatment for hair loss is tulsi. It is prepared as a necessary component of herbal treatments for hair loss. The green functions by fortifying the hair roots, consequently, reduce hair loss, avoid infections caused by bacteria and fungi. Tulsi has been used inside ayurvedic medication over 3000 years.



Table 2: Taxonomy of Tulsi

Kingdom	Plantae
Family	Lamiaceae
Genus	Ocimum
Order	Lamiales
Species	O. tenuiflorum
Biological name	Ocimum sanctum
Other name	Holy basil
Uses	Help to maintain moisture in your scalp Improve blood circulation

Hibiscus:

Hibiscus flowers are used to clout premature graying of hairs, prevent hair loss and spilt ends



Fig.3.Hibiscus Flower

Kingdom	Plantae
Family	Malvaceae
Subfamily	Malvoideae
Order	Malvales
Species	H. Rosa-sinensis
Biological name	Hibiscus rosa-sinensis
Other name	Hibiscus arontti Griff.Ex mast
Uses	Improve hair growth Prevent premature greying

Shikak:

It is an herb especially used for controlling hair fall and dandruff



fig:4 shikakai.

Table 4: Taxonomy of Shikakai

Kingdom	Plantae
Family	Fabaceae
Subfamily	Caesalpinioideae
Order	Fabales

Species	S. Rugata
Biological name	Acacia concinna
Other name	Senegalia rugata
Uses	Contrast to dandruff and anticipate

Methi:

Fenugreek has antibacterial and antifungal properties which help keep hair issues like dandruff at bay. As per a lot of studies, fenugreek fights the yeast that forms on the scalp and causes dandruff.



Fig 5: Fenugree

Table 5: Taxonomy of Fenugreek

Kingdom	Plantae
Family	Fabaceae
Genus	Trigonella
Order	Fabales
Species	Foenum-graecum Linn
Biological name	Trigonella foenum-graecum
Other name	Fenugreek
Uses	Help to treat thinning hair Help in hair

Almond oil:

Almond oil rich in Vit E used in the treatment of hair loss and strengthen the hairs.



Fig 6: Almond oil

Table6: Taxonomy of almond oil

Kingdom	Plantae
Family	Rosaceae
Genus	Purnus
Order	Rosales
Species	P. Amygdalus
Biological name	Purnus amygdalus
Other name	Almond tree Sweet almond
Uses	Decrease hair thinning Treat hair loss strengthens the hair

Coconut oil: Coconut oil nourishes the scalp and provide shine to the hairs



Fig 7: Coconut oil

Table 7: Taxonomy of coconut oil

Kingdom	Plantae
Family	Arecaceae
Genus	Cocos L.
Order	Arecales
Species	C. nucifera
Biological name	Cocos nucifera
Other name	Fossil oil Lubricating oil
Uses	Moisturizes dry hair to prevent dandruff

Rose flower



Rose flower

Taxonomy of Rose flower

Kingdom	Plantae
Family	Rosaceae
Genus	Rosa
Order	Rosales
Species	Rosa-sinensis
Biological name	Rosa-Rubiginosa
Uses	As a flavouring agents Anti-depressant

Experimental Section:

MATERIAL AND METHODS:

The herbal hair oil was prepared by collecting and using Various plant materials. These are Aloe vera, leaves of Holy basil, flower of Hibiscus rosa-sinensis, seed of Trigonella foenumgraecum, seedpod of Acacia concinna, all were collected from Agricultural fields. Collected plants Were identified by my project guide Prof. Ratana D. Nikum. The oils used for herbal hair oils were Cocos nucifera oil and Purnus amygdalus. All the collected oils were identified by project guide.

Formulation of herbal hair oil:

The formulation of herbal hair oil are as follows:

Ingredients	Quantity (%)
Aloe vera	4 %
Tulsi	2 %
Hibiscus	1%
Shikakai	5 %
Fenugreek	2 %
Almond oil	60 %
Coconut oil	25 %
Rose	1 %

Ingredients used in hair oil Formulation

Sr. No.	Ingredients	Uses
1	Hibiscus	Anti-Dandruff
2	Aloe-Vera	Anti-Microbial
3	Fenugreek	Hair-Growth
4	Coconut Oil	Moisturizers Dry Hairs
5	Almond Oil	Prevent Hair falls
6	Tulsi	Improve Blood Circulation
7	Rose	Maintains Your Natural Moisture & Elecricity
8	Shikakai	Contrast to Dandruff & Anticipate

Role of herbs in herbal hair oil

Process:

The process involves in formulation are as follows:

Precisely collection and drying of the all herbs such as Tulsi, hibiscus, shikakai, methi, and Aloe vera pulp



Weigh all the ingredients and in the mixture and mixed in the 60% of almond oil
Boil the above content for 15 min. and filter through the muslin cloth in the filtrate add 25 % coconut oil to make up the final volume (100ml)



Finally add small amount of flavorings agent to the oil and place the oil in Amber colour bottle.

Evaluation of herbal hair oil:

The prepared oils were then subjected to evaluation parameters are as follows:

Density:

Oil has a specific gravity of 0.9gm/ml and distilled water has a density of 0.997 gm/ml at room so, Density of Oil=Specific gravity of oil x Density of Distilled Water

=0.89gm/ml x 0.997gm/ml =0.887gm/ml

Specific gravity:

Initially empty specific gravity bottle was weighed. Then the same specific gravity bottle was filled with water and again weighted later specific gravity bottle was replaced with hair tonic and weighed again. Weights are noted and thus specific gravity of hair tonic was calculated.

Weight of empty specific gravity bottle = w ↑ gms. Weight of specific gravity bottle with water = w2gms.

Weight of specific gravity bottle with hair tonic = w3gram.

Specific gravity bottle of water = 0.9961 g/cm3 specific gravity of hair tonic was calculated as P=w3-w1/w2-

W1xp P=0.8988

pH:

The pH of herbal hair oil was determined using pH meter.

Sensitivity test: The prepared herbal hair oil was applied on 1 cm skin of hand and exposed to sunlight for 45min.

Viscosity:

The viscosity was determined using Ostwald's viscometer Solubility: Soluble in non-polar solvents.

Polarity:

Non-polar compound.

The prepared polyherbal hair oil using the mentioned ingredients was evaluated for the following parameters and the results are as follows:

Evaluation parameters	Inference
Colour	Yellowish brown
Odour	Aromatic
Density	0.887
Specific gravity	0.8988
pH	6.4
Sensitivity test	Non-sensitive
Solubility	Soluble in non-polar compound
Polarity	Non-polar

Evaluation parameters of herbal hair oil

The results obtained for the evaluation test are under the specified limits. Colour is yellowish brown and the oil has aromatic odour. The results obtained for physical parameters like specific Gravity. pH according to thee started values. In biological evaluation. It is tested on human skin and it did not produce any inflammation, allergy reactions.

Ingredients	**Role**
Aloe Vera	Boosting scalp health
Tulsi	Anti bactarial
Hibiscus	Controls premature graying
Shikakai	Antidandruff
Fenugreek	Hair growth
Almond oil	Treat hair loss and strengthens the hair
Coconut oil	Moisturizes dry hair
Rose	Conditioning agent, provides good odour.

Role of ingredients in herbal hair oil.

RESULT & DISCUSSION

Overall the formulated herbal oil provides many nourishing value to hair such as vitamins, minerals & essential oil. The finished product is within the limits. In conclusion oil is beneficial to prevent hair from damage loss caused by pollution & dull hair & promote hair growth & provide on alternative source of hazardous chemicals

FUTURE SCOPE

The future scope for herbal hair oil looks promising, as there's a growing trend towards natural and sustainable products. Consumer interest in plant-based solutions for hair care, coupled with increasing awareness of the potential benefits of herbal ingredients, could contribute to the continued success of herbal hair oils in the market. Formulating with well researched botanicals and emphasizing eco-friendly packaging could enhance the produce's appeal. Additionally, effective marketing strategies highlighting the unique properties of herbal ingredients and their positive impact on hair health could further boost the product's success.

CONCLUSION

One of the most well-known hair treatments is herbal hair oil. Herbal hair oil not only hydrates the scalp, but also helps to heal dry scalp and hair. It contains various vital nutrients that support regular sebaceous gland activity and encourage natural hair growth. Overall, the formulated herbal oil provides many nourishing value to hair such as vitamins, minerals, and essential oils. The finished product is within the limits. Oil is beneficial to prevent hair from damage and loss caused by pollution and dull hair. And provide an alternative source from hazardous chemicals.

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