

Formulation and Evaluation of Hair Cream by Using Herbal Extract

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ABSTRACT:

Protein fibers called hair originate from hair follicles and extend into the skin's dermis. A typical worry is damaged hair, which can be caused by a number of things including heat style, stressors in the environment, and poor hair care techniques. It takes appropriate hair care practices to maintain healthy hair. According to the study's findings, extracts of *Hibiscus rosa sinensis*, *Withania somnifera*, *Eclipta alba*, *Olea europea*, and *Nigella sativa* were combined in various compositions to produce multifunctional effects on the scalp and hair, including antimicrobial, increased hair growth, prevention of hair fall, and prevention of hair graying. This shield of defense lessens the damaging effects of external stressors on hair and helps to stop more damage. By sealing the hair cuticles, hair cream also helps to provide the appearance of smoother, glossier hair. The study's objective was to create a hair cream with botanical extracts.

KEYWORDS: Herbal hair cream , Herbal formulation , Medicinal herbs , Cream evaluation.

INTRODUCTION:

HERBAL COSMETICS

cosmetics also known as natural cosmetics. Now these days, people become more health conscious than before, so, they prefer best. Now a days , herbal cosmetics are growing countries like United States, Canada, United Kingdom, Australia, Germany and France as well as in other developing countries like the Philippines, China and India etc. Herbal cosmetic products containing natural components have showed increasing trend in the market. In a market demand of herbal cosmetics are raised . With globalization, there have been changes in many fields such as improvisation in products, innovation, competition, brand image etc. On the other hand, people are drawn to herbal cosmetics because of their natural qualities and low risk of negative effects. Market analysts predict that the herbal cosmetics sector is about to enter a new stage of growth. The current global market for herbal cosmetics is valued at

\$1500 billion, and it is projected to expand at a rate of 25% annually. Among all product categories, natural skin care products hold the largest market share in European nations. The two most developing European markets for herbal cosmetics are those in Germany and France. The main issue in examining global trade, especially in herbal cosmetics, is the paucity of statistical information on production and trade

For over 5000 years, people in China and India have been aware of the medical benefits of many plants and herbs. India holds the second position in the global market share of herbal cosmetics, while China is the world's largest exporter of these products. The tremendous biological diversity of both nations contributes to the evolution of numerous plant and herb species. These nations are now the top exporters of herbal cosmetics thanks to the development of innovative and cutting-edge technology. Since most of the herbs are derived from wild sources, using them for the sustainable growth of the herbal cosmetic businesses requires a rational strategy.

After deregulation, the Indian cosmetics business is rapidly evolving and changing. In the past few decades, it has significantly matured. The global economic recession has proven to be a significant obstacle for important players in the market, such as multinational corporations and limited sector firms, but it hasn't had an impact on the cosmetics industry's overall growth. It was predicted to be between fifteen and twenty percent. The market for ayurvedic products in India is projected to be worth Rs. 2500 crore annually, of which the natural herbal cosmetics segment accounts

for Rs. 450 crore. The estimated value of the Indian personal care market, which includes bath and shower products, hair care, skin care, cosmetics, fragrances, and deodorants, is US\$ 4 billion (about Rs. 20,000 crore). The soap market has expanded at a scents and underarm protectors. Over the past five years, the soap market has expanded at a rate of 5% annually, reaching a market size of US\$ 1.5 billion (about Rs. 7,500 crores). The performance of this industrial sector is determined on the quality, price, marketing, and distribution methods of these consumer products. A distinct department of AYUSH was founded in India in March 1995 with the goal of advancing homeopathy and traditional medical systems. This gave the herbal cosmetic industry a platform and a push. The prospective growth rate of the Indian personal care market as a whole is 15–16% annually, which would allow it to double to US\$ 8 billion (or around 40,000 crore) by 2012.



Fig.1 – Herbal cosmetics

PHARMACEUTICAL AND THERAPEUTIC ASPECT OF COSMETICS:

utilized in cosmeceuticals are classified as food. The use of cosmetics is restricted to improving looks. As dietary supplements or food additives, medicinal botanicals used in cosmeceuticals are approved by the US Food and Drug Administration (FDA) as safe. The FDA's standards for over-the-counter monographs do not apply to the herbs, and direct consumer marketing is permitted without the need for pharmacy status. As a result, there are no established guidelines for herbal potency, concentration in marketed products, safety, or effectiveness research. Such products, used by people of all ages, are cosmetics. The cosmetics industry is globally recognized and has shown to be profitable. A wide range of cosmeceutical preparations, such as infant, bath, and washing solutions, are widely available in the market today.

HAIR:

A vital component of the human body is the hair. Its related issues include hair loss, frizz, unmanageable hair, low volume, conditioning, premature graying, dandruff, hair thinning, dullness, etc. The form, length, diameter, texture, and color of hair can all differ. There is also a chance that the hair's cross section is round, triangular, asymmetrical, or compressed, affecting the hair's curl. Every mammal has hair. Its primary function is to control body temperature. It also seeks to function as a way organ, reduce friction, and protect against sunlight. Hair is a person's greatest asset and has a significant impact on their lives. In the past, hairs on the scalp were thought to provide protection. Additionally, hair contributes to the self-assurance and pride in an individual, regardless of their gender. A person's dream has always been to have black, healthy, glossy, and high-quality hair. Regardless of how long or short they are, everyone prioritizes keeping and maintaining them.

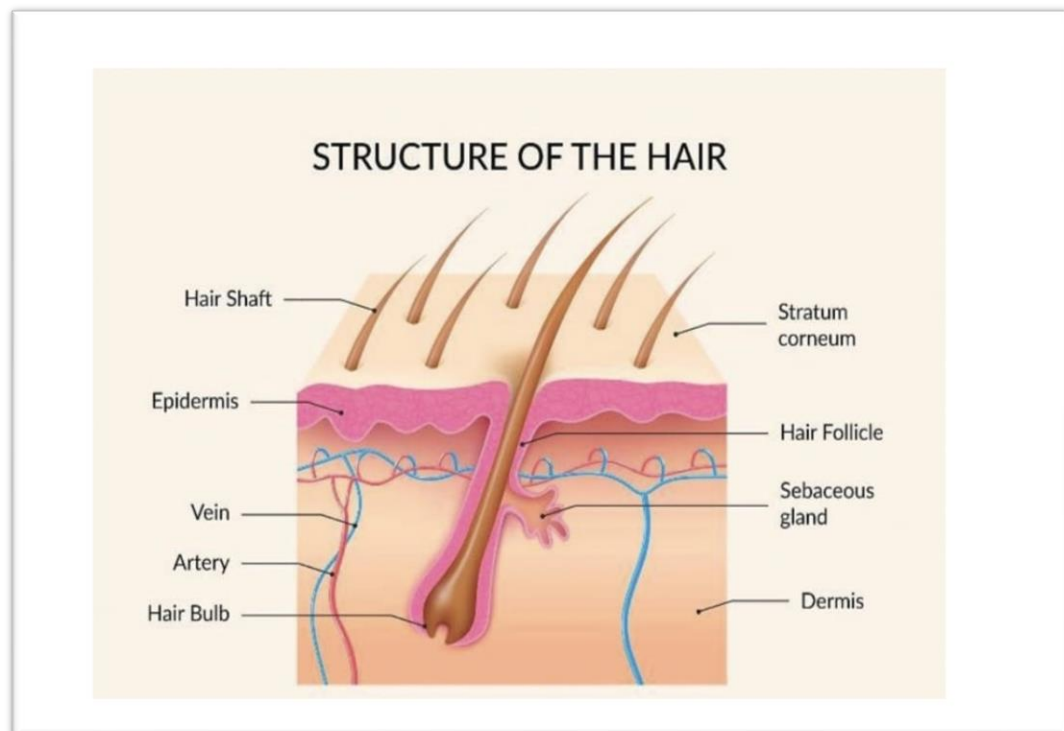


Fig. 2structure of hair

There are two sections to hair:

1. A follicle

The follicle is a structure in the skin that resembles a bulb. A network of blood arteries that supply nutrients to nourish and promote hair growth may be located near the apex of the follicle. We refer to this as the papilla. The epidermis and dermis interact to produce each follicle.

The follicle is segmented into three parts:

The infundibulum of a follicle extends from its surface opening to the level of its sebaceous gland entrance.

Isthmus: Stretches from the level of the arrector Pili muscle insertion to the infundibulum.

Subordinate segments: Dermal papilla, a loose band of vascularized connective tissue, invaginates the base of the bulb. The hair's papilla is full of blood vessels and offers

Inferior segments: A tuft of loose, vascularized connective tissue known as the dermal papilla invaginates the base of the bulb. Numerous blood vessels can be found in the papilla of the hair, which also provides nutrients for hair development

2. Shaft

Three layers comprise the hair shaft:

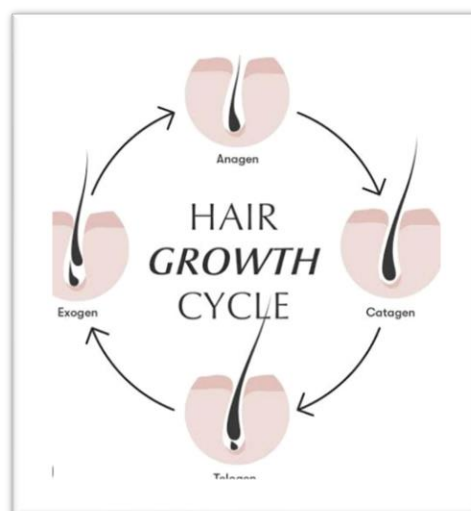
a) Medulla: The medulla is the center of the hair. It will either be continuous or doubled, segmented or broken apart. It is frequently a cell-filled tube or hollow. While some hairs have discontinuous or fractured medullas, the majority of hairs do not. It shapes the hair shaft's midsection. Particularly fine hairs typically lack this layer.

b) Cortex: The greatest portion of the hair shaft, or melanin (hair pigment), is what gives hair its color.

c) Cuticle: There are a few possible Cortex: The greatest portion of the hair shaft, or melanin (hair pigment), is what gives hair its color.

The hair shaft's transparent outer coat may be called the cuticle. It is composed of overlapping scales that shield the hair's inner layers. The hair's proximal end, which is closest to the scalp, and distal end are where the scales point

CYCLE OF HAIR:



Every type of hair passes through a recurring cycle of active growth and rest. Each cycle's relative length

varies depending on the person's age and the body part involved. the area where hair grows. The follicle's cycle phase is distinguished by three distinct stages: anagen, or active growth, catagen, or intermediate period, and telogen, or resting stage.

A. Phase of anagen

As the follicle reaches its maximum length, the matrix cells proliferate and create the internal root sheath, hair shaft cortex and medulla, as well as the cuticular layers that cover the hair shaft and inner sheath. The inner and outer sheaths of epilated anagen hair are still attached and encircle the hair

B. Phase of Catagen

Two characteristics set involutinal hair apart from telogen (clubbed) hair: Compared to clubbed hair, the keratinized (proximal) portions of it are darker. Its exterior and inner sheaths are in better condition

C. Phase of telogen

The remnants of an epithelial sac, which are absent from nongrowing, spontaneously shed clubbed hair, can also encase hair. Of an adult's 100,000–105,000 scalp hairs (irrespective of gender), 90% are in the growing or anagen phase. 10% of the population is still in the resting (telogen) phase

HAIR'S ANATOMY AND PHYSIOLOGY

Between 80,000 to 120,000 essential terminal hairs grow on the scalp of healthy men and women. Keratin, which makes up hair, is created in hair follicles. Every hair follicle has recurrent cycles of growth and rest. For two to six years, a hair grows at a pace of around 0.3 mm per day, or 1 cm per month, during the growth (anagen) phase. The length of the anagen phase determines the maximum length of hair that can be achieved. The hair then falls out after a brief transitional (catagen) phase and a resting (telogen) phase that lasts for two to four months. The approximately 100,000 hairs on a person's head typically grow apart from one another.

HAIR FUNCTIONS

- A. Controlling one's body temperature
- B. reduces the friction
- C. defends against solar radiation
- D. serves as an organ of senses

HAIR DISEASE

Mycotic condition: it is recognized that dandruff and seborrheic dermatitis represent opposite extremes of a same disease spectrum resulting from *Malassezia* species .

Parasitic capitis: *Pediculus humanus capitis* infection is the cause of pediculosis capitis

Conditions characterized by inflammation: distinct erythematous plaques coated in silver-grey scale are the hallmark of psoriasis. The bacterial pathogen *Staphylococcus aureus* is frequently accountable for folliculitis.

CAUSES OF HAIR LOSS

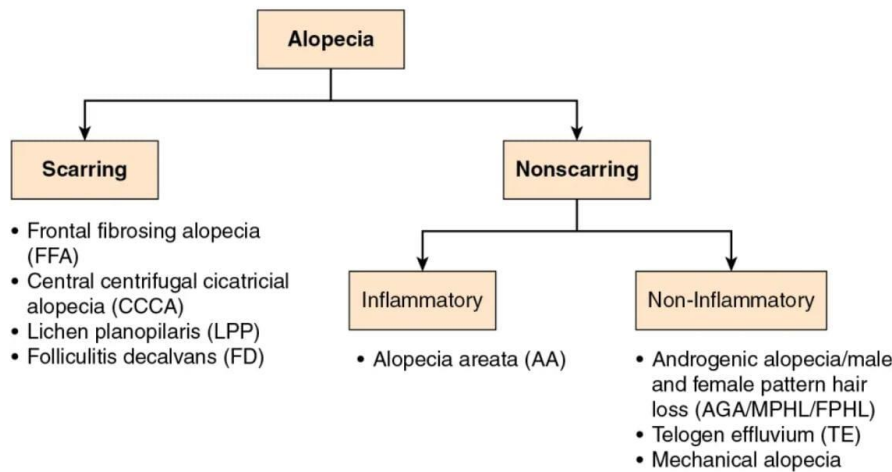
- Reduction in hair follicle function due to male hormones
- Reduction in metabolic function of hair follicles and hair bulb
- Reduction in scalp physiological functions
- Local impairment of the circulation due to tension in the scalp

- Common causes of hair fall such as stress, eating habits, lack of protein
- Hormonal changes and medical conditions
- Radiation therapy to the head
 - Hairstyles and treatments
 - Medications and supplements

TYPES OF HAIR LOSS:

There are various types of hair loss

- Noncicatricial (potentially reversible)
- Cicatricial
- Due to hair shaft abnormalities



ALOPECIA

1. Androgenetic alopecia

AGA, or androgenetic alopecia, is the most prevalent kind of hair loss. Diffuse alopecia over the mid-frontal scalp (female pattern hair loss) is the result when it affects women. Hair follicle miniaturization within follicular units is the cause of this process. It symbolizes a gradual decrease in the hair shaft's diameter, color, and length. The distinctive feature of AGA are these little hairs. The majority of AGA women get regular pregnancies and menses. In those who are genetically vulnerable, testosterone causes this condition. The patients have elevated levels of dihydrotestosterone (DHT) and 5 α -reductase activity in their hair follicles. activates the genes that cause the normal hair follicle to change into miniature follicles by binding to the androgen receptor and the hormone-receptor complex. The decrease in the quantity of terminal turning on the genes that cause the regular hair follicle to shrink into smaller follicles. Diffuse alopecia is caused by a decrease in the number of terminal fibers per follicular unit. Androgenetic alopecia primarily has psychological effects. Men expect age-related hair loss, while women typically don't anticipate or want it to happen to them at any moment .

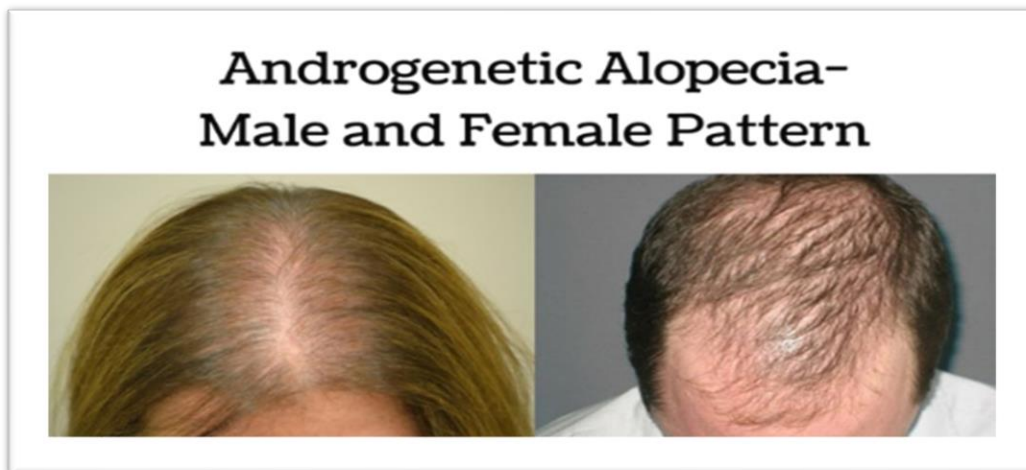


Fig. 3 - androgenetic alopecia

2. Alopecia areata

An inflammatory, non-scarring autoimmune disorder that causes hair loss on the scalp and/or body is called alopecia areata (AA). It causes sporadic hair loss and affects up to 2% of the population. It can result in the loss of all body hair (alopecia universalis) or only the scalp (alopecia totalis). The peribulbar region has an inflammatory lymphocytic infiltration and more catagen and telogen follicles, according to histopathology



Fig. 4 – Alopecia areata

3. Chemotherapy induced alopecia

The majority of cytotoxic anticancer chemotherapy drugs cause alopecia by destroying the hair follicle's rapidly dividing epithelium. The intensity and prevalence of this form of hair loss are correlated with the chosen chemotherapeutic drug and treatment regimen. In the chemotherapy induced alopecia disease of hair 65% of hair loss may be occur .Anagen effluvium brought on by chemotherapy is typically reversible, yet some chemotherapy regimens have the potential to result in irreversible alopecia. When hair regrows in certain situations, there may be moderate to extremely severe hair loss and altered texture. Even though chemotherapy-induced baldness is temporary, it can have catastrophic psychological effects, particularly for women.



Fig. 5 – chemotherapy of alopecia

4. Trichotillomania

At least 3.7 million Americans suffer with trichotillomania, sometimes referred to as hair pulling disorder, an impulse-control condition that significantly impairs functioning. The insatiable urge to alter and rip out hair is a defining feature of this illness. The condition usually manifests in childhood, usually around preschool or preadolescent years, and is seven times more common in children than in adults. The disorder could start off as a habit, much as thumb sucking or nail biting. Physical examination reveals irregularly shaped hair loss areas with strange borders. Short, broken hairs of varying lengths are visible inside these spots. Minimally invasive behavioral therapies and appropriate psychoeducation are viable therapy for this prevalent It is clear that the lengths vary. For this prevalent disease, appropriate psychoeducation and minimally invasive behavioral therapies are viable therapy.



Fig.6 - Trichotillomania

TELOGEN EFFLUVIUM

Telogen effluvium (TE) is a condition in which the hair cycle is disturbed, leading to an accelerated loss of typical club hairs. Kligman initially reported it in 1961, and his theory was that the follicle tends to behave similarly, leading to an early termination of anagen, regardless of the reason of hair loss. Due to the high percentage of subclinical cases, the actual incidence is unknown. Stress, medications, and iron deficiency are common causes of TE .



Fig. 7 – Telogen effluvium

AIM AND OBJECTIVES:

AIM:

The aim of the present study is to carry out the formulation and standardization of multipurpose herbal hair cream.

OBJECTIVES:

The objective of the current study is to, Prevent hair fall

- Promote hair growth
- Treat scalp related microbial disease
- Protection of hair from UV rays
- Prevents scalp hair dry
- Premature graying of hair
- Non greasy formulation

PLAN OF WORK:



1. DAISY

Botanical name: *Eclipta alba*

Synonym: *Eclipta alba* var. *prostrata* (L) Miq., *Eclipta alba* f. *prostrata* huber, *Eclipta alba* f. *zippeliana* (Blume) Hassk

TAXONOMICAL CLASSIFICATION:

Kingdom – Plantae

Class – Magnoliopsida

Order – Asterales

Family – Asteraceae

Genus – *Eclipta*

Species – *Alba*



Fig. 8 – Daisy

MEDICINAL USES

- Nourishes the scalp and hair follicles
- Promotes hair growth and cures baldness
- Treats dandruff and scalp itchiness
- Reduce hair fall
- Stops premature greying of hair
- Treats scalp infection
- Give shine to hair
- Darken the hair

2. HIBISCUS

Botanical Name – *Hibiscus rosa sinensis*

Synonym - *Rosa sinensis*, rose of sharon.

TAXONOMICAL CLASSIFICATION:

Kingdom – plantae

Class – Magnoliopsida Order – Malvales

Family – Malvaceae

Genus – *Hibiscus*. I

Species – *Rosa*



Fig. 9 - Hibiscus

MEDICINAL USES

- Stimulate hair growth
- Conditions hair
- Treats dandruff and itchy scalp
- Prevents hair loss
- Reduce grey hair
- Moisturizes the hair Makes hair smoother and silky
- Improves hair texture
- Prevent split ends
- Hibiscus is effective against Staphylococcus aureus, Staphylococcus epidermis

3. WINTER CHERRY

Botanical Name – WithaniaSomnifera

Synonym – Physalis somniferalinn, WithaniakansuensisKuang, Withaniamicrophysalis Suess.

TAXONOMICAL CLASSIFICATION:

Kingdom – Plantae

Class – Magnoliopsida

Order – Solanales

Family – Solanaceae

Genus – Withania

Species – W. Somnifera



Fig 10. Winter cherry

MEDICINAL USES:

- Improve scalp health.
- Stimulates scalp
- Fights dandruff
- It controls scalp related psoriasis
- Treat cancer Reduces stress
- Improves sleep
- Reduces inflammation
- It controls scalp ailments such as itching
- Improves blood circulation Immunomodulatory effect

4. BLACK CUMIN

Botanical Name – Nigella Sativa

Synonym – Black cumin, black seed, fennel flower, black caraway, nutmeg flower, roman coriander and kalongi

TAXONOMICAL CLASSIFICATION:

Kingdom – Plantae
Class –Magnoliopsida
Order – Ranunculales
Family – Ranunculacea
Genus – Nigella
Species – N.Sativa



Fig.11 - Black cumin

MEDICINAL USES

- Reduce irritation from your scalp
- Help your scalp become dandruff free
- Natural moisturizer for hair and scalp
- Promote hair growth
- Prevents hair loss
- It is powerful antioxidant, reduce inflammation or swelling
- Heals and strengthens hair and scalp

- Black cumin controls dandruff, eczema, psoriasis, dermatitis and it has natural anti-inflammatory properties Antibacterial properties helps eliminate acne
- Black cumin starts the hair growth in bald patches
- It makes hair long and shiny
- Nigella sativa is effective against Candida albicans and Staphylococcus aureus

5. OLIVE OIL

Botanical name – *Olea Europea*

Synonym – *Olea europaea* subsp. *Sativa* (Weston) Arcangeli, *Olea europaea* var. *sylvestris* (Mill) Hegi, *Olea europaea* var. *sylvestris* (Mill) Lehr

TAXONOMICAL CLASSIFICATION :

Kingdom – Plantae

Order – Lamiales

Family – Oleaceae

Class – Magnoliopsida

Genus – *Olea*

Species – *Euro.pea*



Fig.12 – olive oil

MEDICINAL USES

- Strengthening hair follicles
- Stimulates hair growth
- Prevent hair loss
- Reduces scalp irritation
- Treats dandruff
- Makes your hair thicker
- Olive oil moisturizes dry hair and add shine
- Work well for treating split ends
- Increase the anagen phase
- Work as deep hair conditioner

GLOBAL PLANT MATERIAL COLLECTION

After purchasing powdered crude plant material from Siddha Pharmacy and verifying basic quality control parameters, the powdered material was put through the Soxhlet apparatus extraction process.

PROCEDURE FOR EXTRACION

The finely powdered material undergo the Soxhlet extraction method by using hydroalcoholic solvent (70% ethanol and 30% water) for a duration of three successive days (72hrs) the temperature should not exceeding more than 100° C. The dark green color hydroalcoholic extract was collected, filtered and the filtrate was subjected to concentrated under reduced pressure using rotatory vacuum evaporator. The concentrated product was freeze dried and the product was finally used for further experimental studies. The same procedure was followed for the crude drug ashwagandha, bhringraj and hibiscus.



Fig. 13 - Soxhlet extraction

PROCEDURE FOR FORMULATIONS

The type of (o/w) hair cream was select to study. The ingredients such as steric acid and oil soluble components bees wax , lanoline , cetyl alcohol, olive oil were dissolved in oil phase.

The other water-soluble components (extract of Eclipta Alba, WithaniaSomnifera, Hibiscus Rosa Sinensis) and triethanolamine were dissolved in the aqueous phase (part B). Both the mixture A and B heated in a water bath until reaches 700 C. After that aqueous phase was mixed with oil phase with constant stirring. Finally add preservatives and perfume.

Table 1: Composition of cream % w/w

INGREDIENTS	F1 (%W/W)	F2(% W/W)
Eclipta alba extract	1	1
Hibiscus rosa sinensis extract	1	1
Withania somnifera extract	1	1

Steric acid	5	4.5
White bees wax	2	2.5
Cetyl alcohol	4	3.5
Lanoline	1	1.5
Black cumin oil	1	1
Olive oil	4	4
Methyl paraben	0.02	0.02
Propyl paraben	0.01	0.01
Triethanolamine	2	2.1
Water	Upto 100	Upto 100
Perfume 1	Qs	Qs

EVALUATION OF CREAM :

Appearance: from the colour ,texture and roughness of cream the appearance was observed.

pH of the cream: pH was determined by using standard buffer solution. Take 1 g of cream is dissolved in about 100ml of distilled water and its pH was determined.

Viscosity: viscosity of formulation is determined by using Brookfield viscometer at 100 rpm .

Dye test: Place a drop of the cream on a microscopic slide covers it with a cover slip, and examine it under a microscope. If the disperse globules appear red and the ground colorless that is o/w type emulsion. The reverse condition occurs in w/o type emulsion.i.e. the disperse globules appear colorless in the red ground.

Acid value: Take 5 gm of cream and dissolved in 25 ml mixture of alcohol and solvent ether, then the flask was fixed to reflux condenser and heated until the content was dissolved completely, then add 1ml of phenolphthalein and it is titrated with 0.1N NaOH until light pink color appears after shaking the flask for 30 seconds

$$\text{Acid value} = \frac{n \times 5.61}{w}$$

n = Amount of NaOH required
W = weight of the substance

Saponification value:

Introduce about 2g of substance refluxed with 25ml of 0.5 N alcoholic KOH for 30 Saponification value minutes to this 1ml of phenolphthalein added and titrated immediately, with 0.5 N HCl.

$$\text{Saponification value} = \frac{(b-a) \times 28.05}{w}$$

a = Titrant volume (ml)
b = The volume in ml of titrant
w = Substance weight (gm)

Homogeneity: formulation were checked by visual appearance or by a touch.

Irritancy test: Mark an area (1sq.cm) on the left side of the scalp surface. The cream was applied to specific area of the skin and note the result . Irritancy, edema, erythema was checked if any for regular intervals up to 24hrs and reported.

Rheological studies: The formulated cream was found to be Non – Newtonian. Take a fixed quantity 10grams of cream in a 10 ml beaker. Keep it impact for 1 hr. the beaker that contains cream was inclined at one side and see whether cream is changes to liquified or a not.

Stability testing: Stability of herbal hair cream was determined by centrifugation studies the cream were centrifuged at 3500-13500 rpm at the interval of 10 minutes and further observe for phase.

Type of smear: It was determined by applying the cream on the skin surface on human volunteer. After the use of cream , smear formed on the skin.

RESULTS AND DISCUSSION :

Formulation F1 and F2 was successfully completed with respective procedures and then the formulations F1 and F2 was evaluated for its stability, so the basis standardization parameters was calculated .

Table 2: physiochemical parameters

Sr.No	PARAMETERS	F1	F2
1	Appearance	Pale green	Pale green
2	pH	6.9	6.7
3	Viscosity	27001-27089 cps	25025-25099 cps
4	Dye test	o/w emulsion	o/w emulsion
5	Acid value	3.81	3.87
6	Saponification value	26.8	26.3
7	Homogeneity	Uniform distribution	Uniform distribution
8	Irritancy test	No irritation	No irritation
9	Rheological study	Pseudo plastic flow	Pseudo plastic flow
10	Stability test	No phase separation	Phase separation

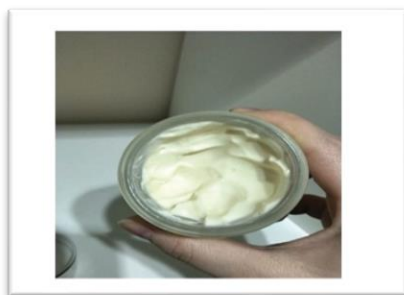


Fig. 14 - Herbal hair cream

We have to perform two formulation batches i.e. (F1 and F2) and evaluated. From the evaluation study F1 formulation more stable than F2 formulation. In the present work decided to extract crude powder drug and formulate herbal hair cream. The herbal hair cream was O/W type of emulsion hence, it can be removed easily by water that gives better customer complaints. So, the better formulation F1 choosed for further in-vitro studies

SUMMARY

The aim and objective of present work was to formulate and evaluate multipurpose herbal hair cream for treat several scalp and hair follicle related problems. It should be stimulate hair growth, hair follicle stimulations and it can able to act against bacterial and fungal related disease. So, our research study completely focused on selections of pharmacologically potent herbal drug, it should be control hair fall

and scalp related microbial diseases. The plants are more potent healers because they promote the repair mechanism in the natural way.

In the study, the formulation of herbal hair cream was prepared using herbal plant extracts such as daisy, hibiscus, winter cherry, black cumin. The cream type was O/W emulsion, this type of emulsion generally non-greasy, easily removed by water and it is more suitable for transdermal drug delivery system. We have totally two formulations were prepared (F1 and F2) with different ratio of oil and aqueous phase. The formulation F1 and F2 evaluated for its physicochemical evaluation such as appearance, pH, viscosity, dye test, acid value, saponification value, homogeneity, irritancy test, rheological studies based on the evaluation study, stability test the F1 formulation is more stable than F2 formulation so, the F1 formulation choosed for in-vitro antimicrobial study, it was performed by using well diffusion method totally two different stains staphylococcus aureus (bacteria) and candida albicans (fungus) were used. Both the microbial growth was significantly inhibited by herbal hair cream. Then the cream was objected to sun protection factor analysis by UV spectrometric method and the result of the study was positively noted. It has ability to block 50% of UV rays from sunlight. From the present study it can be concluded that it has significant antimicrobial activity and UV protection activity so we can continue with further in-vivo studies.

CONCLUSION

According to the study's findings, extracts from Hibiscus rosa sinensis, Withania somnifera, Eclipta alba, Olea Europea, and Nigella sativa were combined in various compositions to produce multifunctional effects on the scalp and hair, including antimicrobial, hair fall prevention, increased hair growth and follicles, hair greying prevention, hair dryness prevention, and UV radiation protection. We are aware that using a single herb will not provide an effective result, but using a variety of extracts can improve the formulation's efficacy. The evaluation research verified the results, which showed that the F1 formulation was more stable than the F2 formulation. Thus, the F1 formulation was used in additional in-vitro experiments, which demonstrated strong antibacterial and UV protection activities. In-vivo pharmacological evaluation can be used to conduct more thorough research.

REFERENCES

1. Kamilia F Taha, Seham S. El Hawary. Hala M. El- Hefnawy, Mona I. Mabrouk, Rania A. Sand, Marwa Y. El Harriry, Formulation and Evaluation of a Herbal Hair Cream Against Certain Dermatophytes, International Journal of Pharmacy and Pharmaceutical Sciences.8(3): 167-173
2. P. Suresh Kumar, S.Suchete, A.Umamaheswari, V.SudarshanaDeepa, In-Vitro and InVivo Evaluation of Anti- Dandruff Activity of Formulated Polyherbal Hair Oil, Journal Of Pharmacy Research. 2010; 3(12): 2956-2958
3. T Regupathi, K Chitra, K Ruckmani, KG Lalitha⁴ and Mohan Kumar, Formulation and Evaluation of Herbal Hair Gel for Hair Growth Potential, Journal of Pharmacology & Clinical Research.2017; 2(2)
4. Saleemulla Khan, Inder K. Makhija, Devang Khamar, Sandhya Rani, Development and Standardisation of Turmeric Cream by HPTLC, International Journal of Biomedical and Advanced Research. 2010; 01(04)
5. Mandeep Singh, Shalini Sharma, Sukhbir Lal Khokra, Ram Kumar Sahu, Rajendra Jangde, Preparation and Evaluation of Herbal Cosmetics Cream, Pharmacologyonline. 2011; 2: 1258- 1264
6. M.B Bhaltadak, H.A Navthale, R.R Thenge. S.A Shinde, V. S.Adhov, Formulation and Comparative

- Standardization of Ayurvedic Skin Cream, Indo American Journal Of Pharmaceutical Research.2018; 8(9): 2231-6876
7. Ravi Shankar, BabitaSharangi, Ramesh Gupta, Kamla Pathak, Formulation and Characterization of Polyherbal Cream for skin Manifestations, JAASP Research paper 2016; 1: 360-366.
 8. Melak Mohammed Al-Busaid, Md. Sohail Akhtar, Tanveer Alam, WegdanAlyShehata, Development and Evaluation of Herbal Cream Containing Curcumin from Curcuma Longa, Pharmacy & Pharmacology International Journal. 2020; 8(5): 285-289.
 9. Sharmila Dusi, J. Saminathan,Formulation and evaluation of Aloevera and Dacus Carota Herbal Cream,International Journal of Pharmacy Research & Technology 2020; 10(1)
 10. Ashwini S Dhase, Somishwar S. Khadbadi and Shweta S. Saboo, Formulation and Evaluation of Vanishing Herbal Cream of Crude Drugs, American Journal of Ethnomedicine, 2014; 1(50): 313-314
 11. H.Mahmoudvand, A.Sephvand, S.Jahanbakhsh, B.Ezatpour, S.A.Ayatollahi Mousavi,Evaluation of antifungal activities of the essential oil and various extracts of nigella sativa and its main component, thymoquinone against pathogenic dermatophyte strains, Journal de MycologieMedicale. 2014; 24 :155-161
 12. Fatemeh Forouzanfar, Bibi SedighehFazly Bazzaz, Hossein Hosseinzadeh, Black cumin (Nigella sativa) and its constituents (thymoquinone) a review on antimicrobial effects, Iran Journal of Basic medical Sciences 2014; 17(12): 930-938
 13. M.Burtis and F.Bucar, Antioxidant activity of nigella sativa essential oil, Phytotherapy research, Phytother.2000 ; 14, 323-328
 14. M.A.U.Khan, M.K. Ashfaq, H.S. Zuberi, M.S Mahmood and A.H.Gilai, The invivoantifungal activity of the aqueous extract from nigella sativa seed, Phytotherapy research, phytother.2003 ; 17, 183 -186
 15. S.P.Sudhir, V.O.Deshmukh and H.N.Verma, Nigella sativa seed, A Novel beauty care ingredient: A Review, International Journal of Pharmaceutical Science and Research 2016 ; 7(8): 3185-3196.
 16. Keerthiga Nagarajan, R.V.Geetha, Evalutation of antimycotic activity of black cumin seed extract: In vitro study, Drug Inventation Today. 2018; 10(3): 3247-3250
 17. Salih Hamad Mohamad Aljabre, Mohamad Akram Randhawa, Naeem Akhtar, Omar Mohamad Abdulrahman Mohamed Alquarshi, Ali Aldossary, Anti-dermatophyte activity of ether extract of nigella sativa and its active principle, thymoquinone, Journal of Ethnopharmacology 2005 ; 10 : 116-119
 18. Emad Mohamed Abdallah, Black seed (Nigella sativa) as antimicrobial drugs: A MiniReview, Nov Appro Drug Des Dev. 2017 ; 3(2) , 555603 : 001-005
 19. Kakali Datta, Vishuwajeet Rohil, Anu T Singh, Ashok Mukherjee, Beena Bhat, B.Ramesh, Eclipta alba extract with potential for reversing chemotherapy-induced alopecia : An experimental study in mice, Ann Natl Acad Med Sci (India). 2012; 48(3&4): 43-64
 20. ThongamIbemchaChanu , S.Dam Roy, N.K.Chadha, Kiran Dube Rawat, Arun Sharma, Kundan Kumar, Antistress ability of Eclipta alba ethanol extract in LabeoCalbasu Fingerlings exposed to acid stress, The Israeli Journal of Aquaculture-Bamidgeh. Jan 2013
 21. Amritpal Singh, Sanjiv Duggal, Asish Suttee, Jaswinder Singh, Shankar Katekhaye, Ecliptaalbalinn- Ancient remedy with therapeutic potential, International journal of phytopharmacology. 2010; 1(2): 57-63
 22. Nitesh Shambharkar, Bharat Rathi, Renu Rathi, Dongre N.K, Abhinav Raut, Eclipta alba: Hair

- growth promoting drug in Ayurvedha, WutanHuatanJisuanJishu. Dec 2020; XVI(XII): Dec 2020
23. Archana Pareek, Ashwani Kumar, Bhiringaraj(EcliptaProstrata L.) for mental improving ability, World Journal of pharmaceutical Sciences. 2015; 3(8): 1569-1571.
 24. T.Regupathi, K.Chitra and K.G Lalitha, Antibacterial and antifungal activity of Eclipta alba, International journal of pharmaceutical and phytopharmacological Research. 2014; 4(2): 116-119
 25. Myriam Fezai, Laura Senovilla, Mohamed Jemaa and Mossadok Ben.Attia, Analgesic,anti-inflammatory and anticancer activities of extra virgin olive oil, Journal of lipids 2013, Article ID 129736, 7pages.
 26. NurayYazihan, SevginurAkdas, Yusuf Olgar, DeryaBiriken, BelmaTurnan, Mucahit Taha Ozkaya, Olive oil attenuates oxidative damage by improving mitochondrial functions in human keratinocytes, Journal of functional foods 2020; (71): 104008
 27. WantidaChaiyana, PimpornLeelapornpisid, RungsineePhongpradist and KanokwanKiattisin, Enhancement of antioxidant and skin moisturizing effects of olive oil by incorporation into microemulsions, Nanomaterials and Nanotechnology. 2016; 6 :1-8
 28. Tao Tong, Nahyun Kim, Taesun Park, Topical application of oleuropien induces anagen hair growth in telogen mouse skin, June10 2015; 10(6)
 29. Publio Viola, Marzia Viola, Virgin olive oil as a fundamental nutritional component and skin protector, Clinics in dermatology 2009; 27,159-165.
 30. Mukesh Pandey, Lokesh Adhikari, Rupali Kotiyal, Ajay semalty and Mona semalty. Preparation and evaluation of hair growth formulations of Indian Ginseng (Withaniasomnifera) for Alopecia. Asian Journal of Biological Sciences. 2019; 12(3)
 31. Khanchandani N, shah P, Kalwani T, Ardesna A, Dharajiya D. Antibacterial and Antifungal activity of Ashwagandha (Withaniasomnifera L.): A review, Journal of Drug Delivery and Therapeutics. 2019; 9(5-s):154-161)
 32. Dr. Sudhanshu kumarmeher, Dr. Banmali Das, Dr. Purnendu panda, Dr. G.C. Bhuyan, Dr.M.M. Rao. Uses of Withaniasomnifera (Linn)Dunal (Ashwagandha) in Ayurveda and its pharmacological evidences. Research Journal of Pharmacology and Pharmacodynamics. Jan – Mar 2016; 8(1): 23-29
 33. Narendra singh, Mohit Bhalla, Prashanti de Jager and MarilenaGilca. An overview on Ashwagandha: A Rasayana (Rejuvenator) of Ayurveda. Afr J Tradit complement Altern Med. 2011; 8:208-213
 34. Ruchi Tiwari, Sandip chakraborty, Mani Saminathan, Kuldeep Dhama and Shoor vir Singh. Ashwagandha: Role in safeguarding Health, Immunomodulatory effects, combating Infections and Therapeutic Applications. Journal of biological sciences. 2014; 14(2): 77-94
 35. Biswajit Auddy, Jayaram Hazra, Achintya Mitra, Bruce Abedon, Shibnath Ghosal. A Standardized withaniasomnifera Extract Significantly reduces stress- related parameters in chronically stressed Humans: A Double- Blind, Randomized, placebocontrolled study. 2008; 11: 51- 57
 36. Laila Che Rose, L., SyahirahRusdi, N.N., Asari, A., Effendy Abd Wahid, M., Suhaimi, H. Potential hair growth of crude extract from Hibiscus rosasinensis Linn. Archives of pharmacy practice. 2020; 11(4): 13-19
 37. Rashmi S. Pal., Nikita Saraswat., Pranay Wal., Ankita Wal., Yogendra Pal. Preparation & Assessment of Poly-Herbal Anti-Dandruff Formulation. The Open Dermatology. 2020; 14: 22-27
 38. Pavithra M.K.S., Meena Deviha S., Sowmya R., Sowparnika M., Balakrishnaraja R., Kannan K.P. Studies on the antimicrobial activity of Evolvulusalsinoides, MurrayaKoenigii, Lawsoniainermis,

- Hibiscus rosasinensis, Azadirachta indica against Malassezia furfur using fractional factorial design. International Journal of Research in Ayurveda and Pharmacy. 2016; 7(1): 73-77
39. Faten R. Abdel Ghaffar and Ibrahim A. El-Elaimy. Invitro, antioxidant and scavenging activities of Hibiscus rosasinensis crude extract. Journal of Applied Pharmaceutical Science. 2012; 02(01): 51-58
40. SZ Raduan, MWH Abdul Aziz, AH Roslida, ZA zakaria, A Zuraini, MN Hakim. Anti inflammatory Effects of Hibiscus rosasinensis L. and Hibiscus rosasinensis Var. Alba Ethanol Extracts. International Journal of Pharmacy and Pharmaceutical Sciences. 2013; 5(4): 754-762
41. Padma S. Vankar, Dhara Shukla. Natural Dyeing with Anthocyanins from Hibiscus rosasinensis Flowers. In Journal of Applied polymer Science. December 2011
41. Z.Shahi, M. Khajeh Meharis, M. Hadizadeh. A Review of the natural resources used to hair color and hair care products. In Journal of pharmaceutical Sciences and Research. 2017; 9(7): 1026 -1030
42. AmeyaLanjewar, Soni Maurya, Devendar Sharma, Anchal Gaur. Review of hair problem and its solution, Journal of Drug Delivery and Therapeutics. 2020; 10(3-s): 322-329
43. Katlein Franca, Thiago Saldanha Rodrigues, Jennifer Ledon, Jessica Savas, Anna Chacon. Comprehensive Overview and Treatment Update on Hair Loss. Journal of Cosmetics, Dermatological Sciences and Applications. August 2013; 3:1-8
44. Soni kk and Soni S, Eclipta alba (L.) An Ethnomedicinal Herbal Plant, traditionally use in Ayurveda. Journal of Horticulture. 2017;4(3):2376-0354
45. Dr.vikramsidh and Dr.Omprakashsharma, A review article of Medicinal use of bhringraja(Eclipta Alba Hassk),World journal of pharmaceutical and medical research,2019;5(7),39-40
46. Ishakumari, Hemalatakaurav, Gitika Chaudhary, Eclipta alba (BHRINGRAJ):A Promising Hepatoprotective and hair growth stimulating herb, Asian journal of pharmaceutical and clinical research,2021;14(7),16-23
47. Sukriti Upadhyay and Prashant Upadhyay, Hibiscus rosa-sinesis:Pharmacological review, International journal of research in pharmaceutical andbiomedical sciences,2011;2(4),1449-1450
48. Anil Kumar and Ashathasingh, Review on Hibicusrosasinensis, International journal of research in pharmaceutical and biomedical sciences,2012;3(2),534-538
49. Girdhari Lal Gupta and A.C.Rana,PHCOG MAG: Plant review withaniasomnifera (Ashwagandha): A review, Pharmacognosy Reviews,2007;1(1),129-136
50. SahaRajasekar, Bhupendar Kuldeep, Pharmacognosy and Pharmacology of Nigella Sativa- A Review, International research journal of pharmacy,2011;2(11),36-39
51. Sabira Sultana, Hafiz Muhammad Asif, Naheed Akhtar Asif Iqbal, HaleemaNazar, Riaz Ur Rehman, Nigella sativa: Monograph, Journal of pharmacognosy and phytochemistry,2015;4(4),103-106
52. ShehlaNazir,SMArif Zaidi and Zehra Zaidi, Kalonji seeds (Nigella sativa) in strengthening the Immune system, International Journal of case reports & studies,2(1),55-56
53. Sophia Rhizopoulou, olea europaea L.A Botanical contribution to culture, AmericanEurasian J.Agric.& Environ.sci.,2007;2(4),382-387
54. Boni E. Elewski, Clinical Diagnosis of Common Scalp Disorders, The society for investigative dermatology, 2005; 10(3) :190-193
55. FabianeMulinari-Brenner, Wilma F. Bergfeld., Hair Loss Diagnosis and Management, Cleveland Clinic Journal of Medicine., 2003;70(8):705-712
56. Hans Wolf, Tobias W. Fischer, Ulrike Blume-Peytavi, The diagnosis and treatment of hair and scalp diseases, DeutschesArzteblatt International, DtschArztebl Int 2016; 113: 377-86

57. Heather L. Brannon, MD, The biology, structure, and functions of hair 2021
58. Davinder kumar, Gajendra rajora, Om parkash, Himanshu, Mamtaantil, Virender kumar Herbal cosmetics: An overview, International journal of advanced scientific research 2017;1(4):36-41
59. Elizangela Abreu Dutra, Daniella Almanca Goncalves da Costa e Oliveira, Erika Rosa Maria Kedor-Hackmann, Maria Ines, Rocha Miritello Santoro, Determination of sun protection factor (SPF) of sunscreen by ultraviolet spectrophotometry, Brazilian Journal of Pharmaceutical Science, 2004;40,381-385
60. Shahlla Imam, Iqbal Azhar, Zafar Alam Mahmood, In-vitro evaluation of sun protection factor of a cream formulation prepared from extracts of *Musa accuminata* (L), *Psidium gujava*(L) and *Pyrus communis* (L), Asian J Pharm Clin Res, 2015; 8(3): 234-237
61. Vaishali Bambal, Neha Wyawahare, Ashish Turaskar and Manisha Mishra, Study of sunscreen activity of herbal cream containing flower extract *nyctanthesarbortristis* L and *tagetes erecta* L, International Journal of Pharmaceutical Sciences Review and Research, 2011; 11(1): 142 – 146 60
62. Manisha PralhadSutar, Sanjay Ravindra Chaudari, Screening of invitro sun protection factor of some medicinal plant extracts by ultraviolet spectroscopy method, Journal of Applied Biology and Biotechnology, 2020; 8(6): 48-53
63. Cecilia Jimenez-Lopez, Maria Carpena, Catarina Lourenco-Lopes, Maria GallardoGomez, Jos M.Lorenzo, Francisco J.Barba,MiguelA.Prieto and Jesus Simal- Gandara, Bioactive Compounds and Quality of Extra virgin Olive Oil, Food 2020;1-31
64. Davinder kumar, Gajendra rajora, Om parkash, Himanshu, Mamtaantil, Virender kumar, Herbal cosmetics an overview, International journal of advanced scientific research 2016; 1(4):36-41