

Formulation Evaluation of Herbal Hair Mask

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Abstract: *The present study deals with the formulation and evaluation of a herbal hair mask using natural ingredients beneficial for hair care. Due to increasing awareness about the harmful effects of synthetic chemicals, herbal cosmetics are gaining popularity for their safety and effectiveness. The main objective of this study was to prepare a hair mask that promotes hair growth, reduces dandruff, and improves hair texture using plant-based materials.*

The formulation included selected herbal ingredients possessing nourishing, conditioning, and antimicrobial properties. The prepared hair mask was evaluated for various physicochemical parameters such as appearance, pH, consistency, spreadability, and stability. The results showed that the formulation had acceptable pH, good consistency, and satisfactory stability, making it suitable for application on hair and scalp.

In conclusion, the developed herbal hair mask is safe, effective, economical, and can be used as a natural alternative to synthetic hair care products.

Keywords: Herbal hair mask, Natural ingredients, Hair growth promotion, Anti-dandruff activity, Conditioning effect, Physicochemical evaluation, Stability study, Herbal cosmetics, Safe and economical formulation

I. INTRODUCTION

Hair cosmetics can be characterized as preparations intended for cleaning, altering the texture, changing the colour, revitalizing stressed hair, nourishing the hair and giving the hair a healthy appearance.

Hair are the delicate part of the body. So accordingly take care of them we made the formulation of the hair mask. Are add by knowing their benefits to hairs.

Different people have different varieties of hair; these include dry hair, oily hair, and regular hair. People these days don't have time to consider their physical appearance. Issues with hair, split ends, dandruff, white hair, hair falling out, etc.

Stress, scalp infections, hormone imbalances, insufficient vitamin, food. And mineral intake, and excessive use of chemical shampoos are the causes of hair problems.

Hair is an important part of personal appearance and protection. Due to pollution, excessive use of chemicals, heat styling, ultraviolet radiation, and poor nutrition, hair becomes dry, damaged, dull, and weak. To overcome these problems, hair care products such as shampoos, conditioners, serums, and hair masks are widely used. Among these, hair masks are considered highly effective because they provide deep nourishment and repair to the hair shaft (Barel et al., 2014)

A hair mask is a semisolid cosmetic preparation designed to condition, moisturize, strengthen, and restore damaged hair. It contains natural oils, herbal extracts, proteins, vitamins, conditioning agents, and other nourishing ingredients that penetrate deeply into the hair follicles and scalp. Hair masks help in improving hair texture, reducing hair fall, controlling frizz, preventing split ends, and enhancing shine and softness (Harry, 2000).

The formulation of a hair mask involves selecting suitable ingredients that are safe, stable, and effective for different hair types. Common ingredients include aloe vera gel, coconut oil, argan oil, shea butter, proteins, emulsifiers, preservatives, and fragrances. Proper formulation ensures good consistency, spreadability, stability, and user acceptability (Mitsui, 1997).



Evaluation of the formulated hair mask is essential to determine its quality, safety, and performance. Various evaluation parameters include physical appearance, pH, viscosity, spreadability, homogeneity, stability, washability, irritation test, and conditioning performance. These tests help in ensuring that the product is effective, safe for use, and cosmetically acceptable (Poucher, 2009).

Thus, the formulation and evaluation of hair masks play a significant role in the development of effective hair care products that promote healthy, smooth, and nourished hair.



Fig 1: Problem related to hair

Nowadays, one of the most crucial aspects of one's personal life is having a clean scalp and hair. The most vital component of the body is the hair. Thus, in order to care for them, we developed a hair mask recipe. The benefits of the components used to the herbal hair mask for hair are known. The purpose of using a hair mask is to cleanse the hair of accumulated debris.

The hair mask also contains coconut, neem extract, rosemary oil, amla powder, shikakai powder, hibiscus powder, etc. Chemicals are not used at all in the process of creating hair masks. It doesn't damage your hair because it solely contains natural components. Hair is a sensitive organ and a sign of good health.

ANATOMY OF HAIR :-

Human hair consist of follicles in the anagen, catagen & telogen stages. In the anagen phase, the hair follicle actively cytochrome & grows hair shaft quickly.

Hair is a vital element of the body & serves as a health indicator. This product is critical for those whose hair is extremely thin or whose hair is damaged. If our hair is damaged, If that's the case, our personality will decrease.

There are many different types of hair masks on the market, but they all contain the same ingredients. Chemicals are also harmful to our hair. As a result, we have created a chemical free product



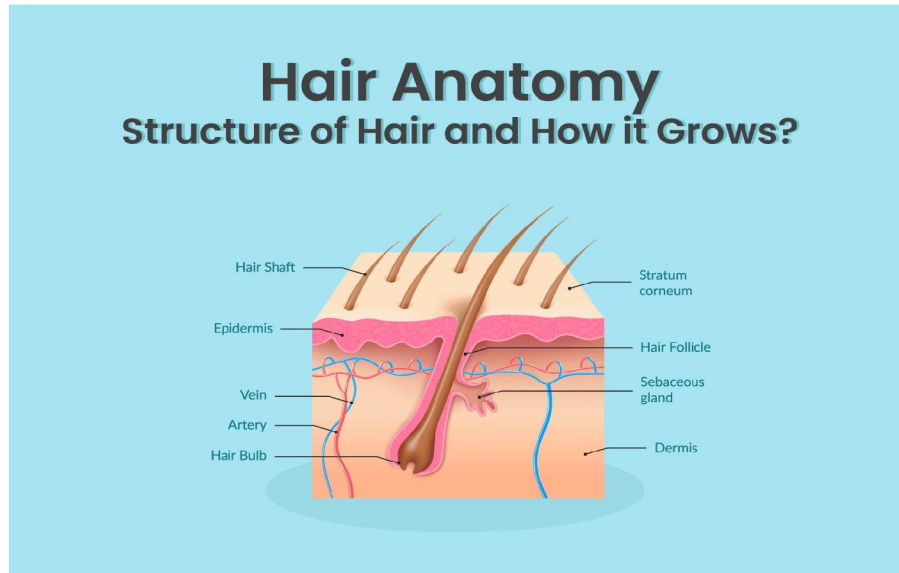


Fig 2 : Anatomy of hair

Hair growth cycle

Hair growth cycle the cycle of growth, rest, and shedding of hair is constant. Three phases make up this cycle: telogen (resting phase), catagen (transitional phase), and anagen (active growth). The length and quality of each phase are determined by a number of factors, including age, hormones, nutrition, and general health.

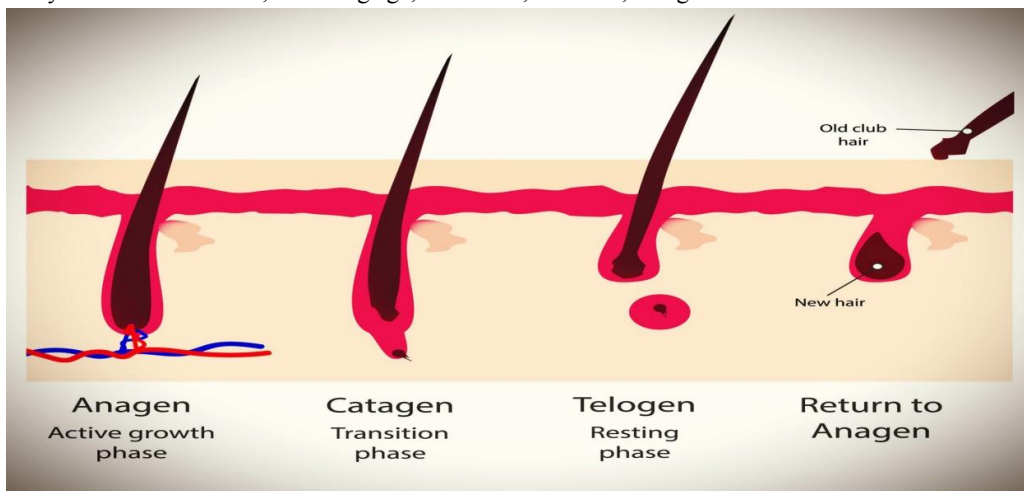


Fig 3: Hair growth cycle

Problems related to hair:

Hair Loss

Although historically discussed as a haul among men, hair loss/thinning hair is additionally common among women. for several men, it's getting to be male pattern balding. Female hair loss is typically caused by stress, medication, changing hormones, and even menopause. Additionally, many hair styling products (chemicals/excessive heat) can contribute to hair loss.

Dry Hair



Shampooing too often causes dry hair. Although squeaky clean hair may be a good thing, many overdo it by washing once, sometimes twice or per day which will strip away all of the hair's natural oils.

Spit Ends

Over-brushing hair, excessive perming, too much heat, and lack of a good conditioner cause split ends.

Oily/Greasy Hair

Oily hair is caused when the scalp produces an excessive amount of natural oil called sebum. Sebum is produced by sebaceous glands, which may sometimes "work overtime", leading to excessive amounts of oil

Frizzy Hair

Frizzy hair occurs when the hair's moisture level falls below normal levels, and it can also be hereditary..

Dull Hair

There are many causes of dull-looking hair chemical or heat styling damage, and environmental soils.

Heat Damaged Hair

Use your curling iron or flat iron too much and your hair will become damaged.

Colour Damaged Hair

When you colour your hair, chemicals are used to open your hair shaft, leaving your hair extremely porous and prone to brittleness and breakage.

Gray Hair

To many, gray hair is a badge of honor. But others would prefer to get rid of it because gray hair can be brittle and more unruly than other strands.

Why Hair Masks?

Enjoying the benefits of a hair mask is the primary reason to purchase this product. A hair conditioner may strengthen and nourish your hair. However, hair masks are more powerful and intense. They can target specific concerns, including scalp and dandruff issues. The best hair mask is a restorative product. It provides deep hydrating, strengthening, and nourishing benefits for your hair. Its application once or twice a week keeps the strands feeling and looking their best.

II. LITERATURE SURVEY

* **Mr. K.J. Kore, et al., (2024):** "These studies offered recommendations for the perception that natural remedies were somehow safer and more efficacious than remedies that were pharmaceutically derived. Herbal cosmetics were known as preparations containing a variety of botanical sources that influenced the functions of the hair and provided nutrients necessary for healthy hair. Hair cosmetics were used to increase the patient's adhesion to alopecia and scalp treatment. Conclusion: Herbal anti-dandruff hair masks helped smooth the irritating, oily, and flaky scalp by controlling dandruff, thus giving an itch-free healthy scalp and nourished hair, because dandruff was a major hair problem."

* **Gauri S. Jujgar, et al., (2024):** She aimed to summarize the creation of a herbal hair mask made with herbs that possessed anti-bacterial, anti-inflammatory, and anti-oxidant properties, utilizing flaxseed, curry leaves, and aloe vera gel. Conclusion: This analysis led to the conclusion that the formulation of the herbal hair mask possessed all the desirable qualities of the perfect hair mask and was proven to be safer, more effective, and more affordable. There were no chemicals whatsoever in the hair mask that was prepared. It had no negative effects on hair because it solely contained natural ingredients.

* **Santosh S. Bansode et al., (2024):** Studies on the anti-dandruff properties of herbal plants like heena, neem and shikakai have been conducted. The natural ingredient in hair cosmetics offer the hair a glossy, smooth appearance and help treat a range of hair problems such as alopecia.

* **Namrata K. Durgani et al., (2023):** This research aimed to create an herbal hair mask. Hair masks were treatments that were applied to hair for a certain amount of time before being rinsed out. They added moisture and nutrients to hair, helping to hydrate dry strands, increase shine, prevent frizz, hair loss, and damage. For the purpose of creating a



hair mask, the powdered forms of strawberry, jatamansi, Bramhi, and Cucuta reflexa were collected. All these fine ingredients were mixed thoroughly by a mixer to form a homogeneous fine powder. The powdered herbs were tested for confirmation of their chemical constituents. The hair mask provided various benefits to hair without having any negative effects on the skin or hair, because all of the ingredients were natural. It was easy to use.

* **Nayak Rutu et al., (2022):** He aimed to formulate and evaluate an anti-dandruff shampoo using synthetic and herbal agents, as dandruff was a common ailment affecting the scalp caused by the yeast Pityrosporum. Dandruff could not be totally eradicated; rather, it could be efficiently managed. There were two techniques to treat dandruff: chemical anti-dandruff shampoo and herbal anti-dandruff shampoo with antibacterial and antifungal components. Synthetic antifungal agents used included Sertaconazole Nitrate, Ketoconazole, Zinc PTO, and Ciclopirox Olamine. He concluded that the novel formulation containing proven anti-dandruff agents with longer contact time at the site of action were the need of the hour and hence proved to be advantageous in anti-dandruff treatments.

III. DRUG PROFILE

1. Cucumber

- * Biological source: the plant species cucumis sativus L.
- * Family: cucurbitaceae
- * Kingdom: plantae
- * Division: magnoliophyta
- * Class: dicotyledons
- * Order: violales
- * Genus: cucumis L
- * Species: cucumis sativus L.



Fig 4: Cucumber gel

Nourishment profile of cucumber:

- * Vitamins: A, B, C and K
- * Mineral: calcium, magnesium, potassium, phosphorus, zinc, fluoride
- * Silica: key for hair strength and growth
- * Water content: high, aiding in hydration



2. Neem powder

- * Biological Source: Azadirachta indica
- * Family :Meliaceae
- * Kingdom: Plantae
- * Division: Magnoliophyta
- * Class: Magnoliopsida
- * Order: Sapindales
- * Genus: Azardichta
- * Species: Azardichta indica



Fig 5: Neem powder

Constituents:

Nimbidin, Azadirachtin, Quercetin, Nimbin, Nimbolide, Fatty Acids (like oleic and linoleic acid)

Uses:

- * Neem helps to cleanse the scalp.
- * Congested pore blockages are cleared and healthy hair development is encouraged. The capacity to produce is essential for treating dry scalp.
- * It has medicinal properties and serves as a preservative for a variety of hair-related problems.

3. Aloe Vera

- * Family: Asphodelaceae
- * Biological Source: Aloe perryi
- * Subfamily: Asphodeloideae
- * Kingdom: Plantae
- * Class: Liliopida-Monocotyledons
- * Order: Liliales
- * Genus: Aloes





Fig 6 : Aloe vera gel

Constituent:

polysaccharides (like acemannan), Proteolytic enzymes, Vitamins A, C, and E, Vitamin B12 and folic acid, Salicylic acid, Lignin

Use:

- * Aloe vera is most beneficial for our hair.
- * It helps to stop the hair fall.
- * It repairs dead skin cells on the scalp.
- * It promotes the growth of hairs.
- * Aloe vera prevents itching on the scalp and reduces dandruff and conditions our hair.

4. Hibiscus Powder

- * Biological Source: *Hibiscus rosa-sinensis*
- * Family: Malvaceae
- * Kingdom: Plantae
- * Subkingdom: Viridiplantae
- * Division: Tracheophyte
- * Subdivision: Spermatophytina
- * Class: Magnoliopsida
- * Genus: *Hibiscus* L
- * Species: *Rosa Sinensis* L



Fig 7 : Hibiscus powder



Constituents: The preliminary phytochemical analysis showed that hibiscus rosa sinensis contained tannins, anthroquinones, quines, phenols, flavonoids, alkaloids, terpenoids, saponins, cardiac glycosides, proteins, essential oils, mucilages.

Uses:

* Act as a scalp moisturizer: The hibiscus flower and leaf mixture are hydrating and nourishing to the scalp. Your hair is kept from drying out by the slimy quality of the mucilage found in leaves and flowers. Using this paste on a regular basis will nourish your scalp and leave your hair silky and manageable.

* Promote hair growth: Because hibiscus is high in amino acids, which are essential for the synthesis of keratin, it can be used to promote hair growth. The protein that nourishes, fortifies, and links hair roots is called keratin.

5. Amla Powder

- * Biological Source: *Umbelica officinalis gaerth*
- * Family: Euphorbiaceae
- * Common Name: Indian Gooseberry
- * Kingdom: Plantae
- * Subkingdom: Angiosperm
- * Division: Tracheophytes
- * Class: Eudicot
- * Order: Malphigials
- * Genus: Phallanthus
- * Species: *Emblica*



Fig 8 :Amla powder

Constituent:

Amla fruits are very high in vitamin c as well as several other antioxidant and nutrients. Compounds and nutrients found in amla fruit: Vitamin c, Vitamin A, Polyphenols, Amino Acids, Proteins, Carbohydrates, Calcium, Potassium, Magnesium, Iron, Carotin, Alkaloid, Gallotannins.

Uses:

- * Strengthens the scalp and hair.
- * Reduce premature pigment loss from hair or greying.
- * Stimulate hair growth.
- * Reduce hair loss.
- * Treat dandruff and dry scalp.
- * Treat parasitic hair and scalp infections like lice infections.



6. Coconut oil:

- * Biological Source: *Cocos nucifera*
- * Family: Arecaceae
- * Kingdom: Plantae
- * Class: Magnoliopsida
- * Order: Arecales
- * Genus: *Cocos* L
- * Species: *Nucifera*



Fig 9 : Coconut oil

Constituents:

Coconut obtained from hard endocarp consist of mixture of triglycerides

Uses:

- * Promotes hair growth
- * Reduces hair protein loss
- * Prevents dandruff and dry scalp
- * Adds shine and softness to hair
- * Helps reduce split ends and hair breakage
- * Commonly used in hair oils, shampoos, and hair masks

7. Methi:

- *Biological source: dried seed of *trigonella fornum*
- *Family: fabaceae
- *Common name: fenugreek
- *Kingdom: plantae
- *Division: magnoliophyta
- *Class: magnoliopsida
- *Order: fabales
- *Genus: *trigonella*
- *Species: *T.foenum-graecum*





Fig 10 :Meethi seed

Constituent

Fenugreek (*Trigonella foenum-graecum*) contains several important phytochemicals and nutrients responsible for its medicinal, nutritional, and cosmetic properties.

Advantages:

- 1.Strength hair from root.
- 2.Treat follicular roots.

8. Shikakai:

*Biological source: dried pods,seeds,of the acacia concinna plant

*Family: fabaceae

*Common name: acacia concinna

*Division: magnoliopsida

*Order: fabales

*Genus:acacia

*Species: acacia concinna²²



Fig 11: Shikakai



Constituent:

Shikakai (Acacia concinna) is a traditional herbal plant widely used in hair care preparations because of its natural cleansing, conditioning, and antimicrobial properties. The pods, leaves, and bark contain several bioactive constituents responsible for its cosmetic and medicinal activities.

Uses:

- * Herbal shampoos
- * Hair masks
- * Hair oils
- * Hair packs
- * Ayurvedic cosmetic formulations

9. Reetha:

- * Biological source: sapindus mukorossi tree
- * Family: Sapindales (soapberry family)
- * Common name: soapnut tree
- * Kingdom: plantae
- * Division: magnoliophyta
- * Class: magnoliopsida
- * Order: sapindales
- * Genus: sapindus
- * Species: sapindus mukorossi



Fig 12 :Reetha

Constituents:

Saponin, flavonoids & phenolic compounds, mucilage, fatty acids.

Uses:

Reetha shows colling effects & acts like a very good thing cleansing of the skin.

- * It prevents the scalp from drying out & keep the skin soft.
- * It may clean the oily secretions in the skin.

Advantages:

1. Control dandruff & itchy scalp.
2. Mildly antiseptic & has detoxifying effects.
3. Nourishes dry & rough hair.

10. Rosemary:

- * Biological source: salvia rosmarinus



- * Family: lamiaceae
- * Common name: Rosmarinus angustifolius mill
- * Kingdom: plantae
- * Division: angiosperm (magnoliophyte)
- * Class: magnoliophyte (dicotyledons)
- * Order: lamiales
- * Genus: rosmarinus
- * Species: s. Rosmarinus officinalis

Constituents:

The rich presence of antioxidants helps further the oil's usefulness in many hair care regimens. You can also find Carnosic Acid, Carnosol, and Rosmanol in it, and these nutrients help boost the immunity of hair cells and make them resistant to frequent breakage. They also help negate the effect of free radicals.



Fig 13 :Rosemary powder

Uses of Rosemary:

1. Stimulates Hair Growth
2. Prevents Hair Loss
3. Strengthens Hair Follicles
4. Reduces Dandruff and Improves Scalp Health
5. Offers Natural Shine and Luster

IV. AIM & OBJECTIVES

Aim: To formulate and evaluate an effective herbal anti-dandruff hair mask

Objectives:

- * To prepare the herbal hair mask with natural powder ingredients
- * To formulate non-toxic natural, effective herbal hair mask with numerous activities like promoting hair growth, conditioning nourishment, etc.
- * To evaluate the performance of formulated herbal hair mask
- * To prepare an easy to use hair mask
- * To overcome the safety issue of synthetic hair care product



V. PLAN OF WORK:

1. Literature survey
2. Selection and collection of herbal ingredients
3. Extraction of herbal ingredients
4. Material & Methods
5. Formulation of herbal hair mask
6. Evaluation of the herbal hair mask
 - * Physical examination
 - * pH test
 - * patch test
 - * Spreadability test
 - * Foam test
 - * Washability test
7. Result & Discussion
8. Conclusion

VI. MATERIAL & METHOD:

All the natural ingredients were purchased from trusted supplier which are used in formulation.

SR.NO.	INGREDIENTS	MANUFACTURE
1	Cucumber gel	Dr.Jain Forest Herbal Pvt.Ltd Dadar(west),Mumbai-400028
2	Neem powder	Sheth Sakharam Nemchand Rasshala,Solapur-6
3	Aloe vera gel	Esmc consumer Pvt Ltd Haridwar-249402
4	Hibiscus powder	Sheth Sakharam Nemchandh Rasshala,solapur-6
5	Amla powder	Yogesh Pharmacy,Nandwd-431603
6	Coconut oil	(H)N M COCONUT OIL MERCHANT Tamilnadu-638111
7	Methi powder	Sheth Sarkharam Nemchandh Rasshala,SOLAPUR-6
8	Shikakai powder	Yogesh Pharmacy,Nanded-431603
9	Reetha powder	Sheth SAKHARAM Nemchandh Rasshala,SOLAPUR-6
10	Rosemerry powder	Sheth SAKHARAM Nemchandh Rasshala,SOLAPUR-6
11	Methyl paraben	Shreeji pharma international vadodara,India
12	Lavender oil	Dr.Jain Forest Herbals pvt.LtdDadar(west),Mumbai-400028

Instruments :

The list of instrument use in formulation

SR.NO,	NAME OF INSTRUMENT	PURPOSE
1	Digital balance	To accurately weight all ingredient
2	Measuring cylinder/spoons	For measuring small volumes (e.g.,oils,preservatives,essential oil).
3	Glass rod/spatula	To stir and mix the formulation
4	Water bath or hot plate	To gently warm coconut oil(if needed for dissolving methyl paraben).
5	Mortar and pestle	To finely grind or mix herbal powders if required
6	Stainless steel or ceramic bowl	For combining the full formulation.
7	Sieve mesh	To remove any large particles from powder or final product.
8	Ph paper/ph meter	To check Ph IF needed for scalp compatibility



9	Sterile container/jar	For storing the final product
10	Gloves and face mask	For hygiene during preparation

VIII. METHOD FOR EXTRACTION:

Here's a simple method to prepare cucumber gel

Ingredients:

- * 1 medium-sized fresh cucumber
- * 1 tablespoon aloe vera gel (optional, for extra soothing properties)
- * A few drops of vitamin E oil or essential oil (optional, for preservation and scent)

Equipment:

- * Blender or grater
- * Strainer or cheesecloth
- * Bowl
- * Sterile container or jar

Steps:

1. Wash and peel the cucumber (you can leave the peel if you want added nutrients).
2. Grate or blend the cucumber into a fine pulp.
3. Strain the pulp using a cheesecloth or fine strainer to extract the juice.
4. (Optional) Add aloe vera gel (1 tablespoon) and mix well for a thicker gel texture.
5. (Optional) Add a few drops of vitamin E oil or an essential oil like lavender for added benefits and preservation.
6. Refrigerate the mixture for 30 minutes to enhance the gel consistency.
7. Store the gel in a clean, airtight container in the fridge.

IX. METHOD OF PREPARATION:

1) Powder Mixing:

- * Accurately weigh all the herbal powders (rosemary, fenugreek, hibiscus, shikakai, reetha, neem, and amla).
- * Sift to remove coarse particles and mix them in a bowl to ensure uniformity.

2) Gel Phase Preparation:

- * In a separate bowl, combine cucumber gel and aloe vera gel.
- * Gradually mix in the herbal powder blend using a spatula to avoid lump formation.
- * Add purified water if needed to adjust to a smooth paste consistency.

3) Oil Phase:

- * Warm the coconut oil slightly using a double boiler.
- * Dissolve methylparaben in the warm oil. Mix until fully dissolved.

4) Combining Phases:

- * Slowly add the oil phase to the gel-powder mixture with continuous stirring until a homogeneous paste forms.

5) Perfuming:

- * Add 3–5 drops of lavender essential oil and mix thoroughly.

6) Packaging:

- * Transfer the finished hair mask into a clean, sterilized container with a tight lid.





Fig 15 :Formulation of herbal hair mask

X. PREPARATION OF DIFFERENT BATCHES:

FORMULATION: This formulation is prepared as per the optimized formulation given in table 2 using the general method of preparation and subjected for evaluation test.

SR.NO.	INGREDIENTS	QUANTITY					
		F1	F2	F3	F4	F5	F6
1	Cucumber gel	3.00gm	3.2gm	3.5gm	3.5gm	3.5gm	3.5gm
2	Neem powder	1,00gm	1.2gm	1.2gm	1.2gm	1.2gm	1.2gm
3	Aloe vera gel	1.5gm	1.5gm	1.5gm	1.5gm	1.5gm	1.5gm
4	Hibiscus powder	2.00gm	2.00gm	2.2gm	2.2gm	2.2gm	2.2gm
5	Amla powder	2.00gm	2.00gm	2.2gm	2.2gm	2.2gm	2.2gm
6	Coconut oil	1.5ml	1.8ml	2ml	2.00ml	2.0ml	2.00ml
7	Methi powder	1.5gm	1.8gm	2.00gm	2.00gm	2.2gm	2.2gm
8	Shikakai powder	1.2gm	1.2gm	1.5gm	1.5gm	1.5gm	1.5gm



9	Reetha powder	1.2gm	1.2gm	1.5gm	1.5gm	1.5gm	1.5gm
10	Rosemerry powder	2.8gm	3.00gm	3.2gm	3.2gm	3.4gm	3.4gm
11	Methyl paraben	0.3gm	0.3gm	0.3gm	0.3gm	0.3gm	0.3gm
12	Lavender oil	0.1ml	0.1ml	0.15gm	0.15ml	0.15ml	0.15ml
13	Total	20gm	20gm	20gm	20gm	20gm	20gm

Phytochemical Screening of herbal hair mask

SR.NO.	TEST	OBSERVATION	INFERENCE
1	*Test for flavonides- Alkaline reagent test (extract +10%NaOH)	Formation of intense yellow colour	Flavonoids are present
2	*Test for tannis- 2ml extract+1%lead acetate	Yellow ppt	Present of tannins
3	*Test for Saponin- 2ml extract+1% lead acetate	Formation of foam	Saponin is present
4	*Test for amino acid- 2ml extract +2ml ninhydrin Reagent and boiled for 2 min	Formation of blue colour indicates	Amino acid is present
5	*Test for alkolioid- 3ml extract +1ml Hcl heat for 20 min than cooled and filter it	Formation of brown reddish ppt	Alkaloid is present
6	*Test for anthraquinone- 3ml extract +10% ammonia solution	Formation of pin,red,or violet colour	Anthraquinone is present
7	*Test for Terpenoids- 2ml extract +chloroform and sulfuric acid	Formation of brown colour	Terpenoids is present

XII. EVALUATION PARAMETER OF HERBAL HAIR MASK

Prepare formulation of hair mask were subjected to following evaluation parameters:

*** Organoleptic properties**

The examination of formulation was performed under the evaluation it involves macroscopic aspects of the drug or product such as colour, odour, texture, by using sensory organ such as eye and nose.

*** Physiochemical properties:**

* **pH:** The pH of 10% hair mask solution in distilled water was determined at room temperature 25°C. The pH was measured by using digital pH meter.

* **Washability:** Formulation was applied on the skin and ease and extend of washing with water were checked manually.

* **Patch test:** In this procedure, a small amount of moistened formulation is applied to the hand surface and the effect of the formulation on irritancy and itching have been noticed.

* **Foam test:** The foam test a simple method to detect the presence of saponins in plant-based products like herbal hair masks.

XIII. RESULTS

Colour and texture

Physical appearance:-

The physical appearance of developed formulation was checked for colour, odour and consistency. Observation were reported.



Determination of Ph:-

The Ph measurement was done using Ph meter. Ideal value should be between 4.5 to 5.5 (pH of scalp). Observed value herbal hair mask is 5.5



Fig 16 :Digital ph meter

Patch test:-

It is carried out by a applying product on the skin for 10 min and observed no irritation occurs.



Fig 17 :Patch test

Foam test:-

Pour the mixture into measuring cylinder or test tube with a tight lid. Shake vigorously for about 15-30 seconds.



Fig 18 :Foam test



Result:

SR.NO	EVALUATION PARAMETER	F1	F2	F3	F4	F5	F6
1	COLOUR	Medium dark brown	Light to medium brown	Medium brown	Rich dark brown	Yellowish brown and olive brown	Medium to dark brown
2	TEXTURE	Rough	Rough	Rough	Rough	Smooth	Smooth
3	ODOUR	Unpleasant	Unpleasant	Unpleasant	Acceptable	Pleasant	Pleasant
4	NATURE	Semisolid paste	Semisolid paste	Semisolid paste	Semisolid paste	Semisolid paste	Semisolid paste
5	PH	6	6	6	6.4	5.9	5.5
6	WASHABILITY	Easily Wash	Easily Wash E	Easily Wash	Easily Wash	Easily Wash	Easily Wash
7	SKIN IRRITATION	Absent	Absent	Absent	Absent	Absent	Absent

XIV. DISCUSSION

The study was undertaken within aim to develop herbal hair mask of cucumber and rosemary. Many formulation were made to develop herbal hair mask out of 5 formulation prepared, 'F6' Formulation give appropriate colour, texture, odour to product quality. Which concluded as product of formulation to minimized side effect of herbal hair mask. All formulation is changes formulated & evaluated. To overcome the defect in previous formulation further are taken correspondingly to next formulation. From both consistency and quality control test of view 'F6' was declared to be best formulation out of 6 formulation of herbal hair mask.

XV. CONCLUSION

Study concluded that herbal hair mask can be successfully formulated using different natural ingredients such as cucumber, neem powder, aloe vera, hibiscus, amla, coconut oil, fenugreek, shikakai, reetha, rosemary. Cucumber is providing hydration, promotes hair growth, reduces dandruff, soothing effect to the scalp. It will be better option for synthetic agents which may arise different side effects. Regular use can improve overall hair texture, shine and resilience, making it an effective and holistic addiction to any hair care routine.

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