



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

“Formulation And Evaluation Of Polyherbal Antidandruff Hair Mask”

1Ms, Sheetal .S. Ghogre, 2Dr. Sunil .S. Jaybhaye, 3Mr, Arshad .A. Ansari, 4Ms. Pooja .P. Ambhure

1B.Pharmacy, 2Principal, 3Associate Professor, 4Assistant Professor

1institute of pharmacy,Badnapur,

2institute of pharmacy,Badnapur,

3institute of pharmacy,Badnapur,

4institute of pharmacy,Badnapur

Abstract:

Polyherbal anti dandruff hair mask helps you smoothen the irritating, oily and flaky scalp by controlling dandruff thus giving you itch free healthy scalp and nourished hairs. The dandruff is a major problem of scalp, which cannot be fully cured with the aid of chemical. This chemical causes split ends and weakens the hair. Hairs are the delicate part of the body. The herbal mask's formulation was assessed using several criteria including stability studies, pH, and antimicrobial activity. The final product's evaluation parameters were discovered to be within allowable bounds. Therefore, it can be said that using a prepared hair mask helps to prevent dandruff and promote healthy hair development.

Keywords: Polyherbal hair mask, Hair, Herbal Ingredients.

1. INTRODUCTION

1.1 Hair: Hairs are the delicate part of the body. Hair is a vital element of the body & serves as a health indicator.

1.2 Hair Growth Cycle

Human hair consist of follicles in the anagen, catagen & telogen stages. 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

➤ Hair Growth Cycle



Fig 1: Hair Growth Cycle

1.3 About Hair & Scalp

Covering the surface of our head, the scalp, extends from the top of your forehead across to the epicranial aponeurosis of the head. Laterally, it reaches down to the external auditory meatus and zygomatic arch (cheekbone of the skull). The scalp consists of 5 distinct layers:

- Skin
- Connective tissue
- Epicranial aponeurosis
- Loose connective tissue
- Pericranium

1.4 Scalp

The scalp is obviously hairy and has many sebaceous glands (oil glands) scattered across it. This density at which these glands are found means that the scalp can commonly be affected by sebaceous cysts. Scalp hairs protrude from structures known as hair follicles, which are situated in the dermis of the scalp.

1.5 Scalp Histology : This is the portion of skin that contains structures such as the hair follicles, sweat glands, and dermal papillae. The dermal papillae is stromal and comprised of connective tissue. There is also a thicker layer of connective tissue beneath known as the reticular layer. This extends to the subcutaneous layer (hypodermis), which is positioned above the fascia. Within the subcutaneous layer, the basal portion of sweat glands can be found. There are many hair follicles in the skin of the scalp.

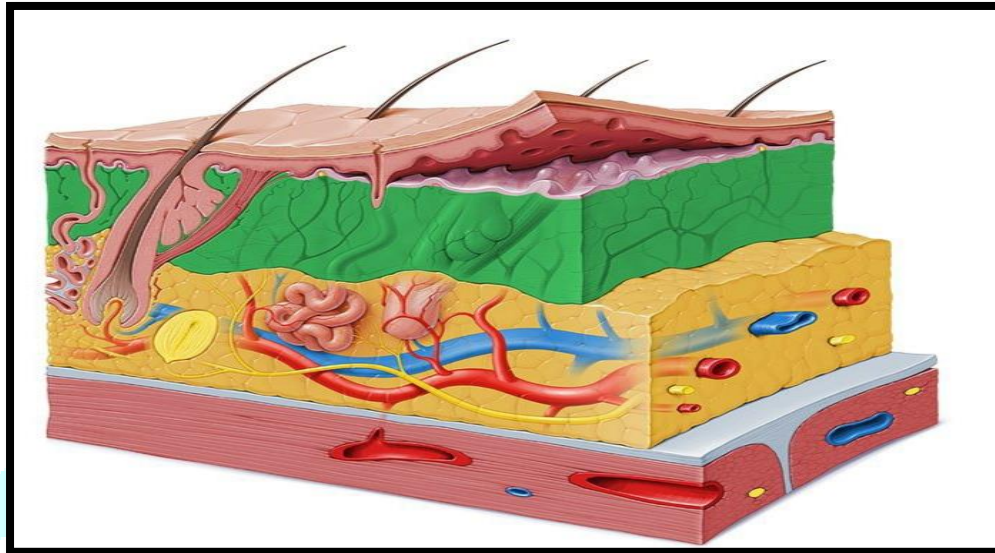


Fig 2: Scalp Histology

1.6 Dandruff Scalp Disorder:

Dandruff is a common scalp disorder, characterized by presence of coenocytes that form clusters due to their high cohesive power, in the form of flaky white to yellowish scales, accompanied by itching. It has been observed that dandruff occurs mainly between puberty to middle age, the phase when sebaceous glands are most active.

2. Mechanism By Which Dandruff Caused:

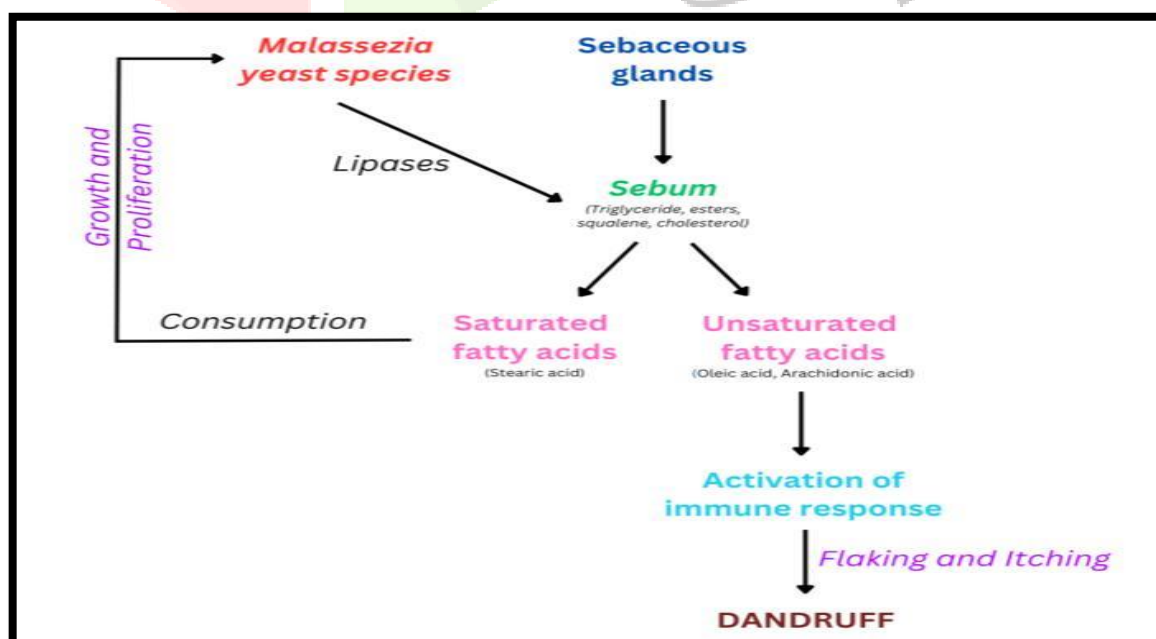


Fig 3: Mechanism Of Dandruff

• Causes of Dandruff:

Dandruff is primarily caused by a dry scalp and other underlying causes. It affects many people and is a common hair issue. The condition can irritate your scalp and make it itchy and flaky. Even though it is not a major health risk, it can make you feel awkward or selfconscious.

1.Dry Scalp

2. Lack Of Good Hygiene

3.Skin Condition

3. Benefits Of Polyherbal Hair Mask:

- Cleansing
- Remove Dandruff
- Scalp Health
- Moisture Balance

Advantage of hair mask:

There are many benefits to using a hair mask, and the advantages vary depending on the ingredients and your hair type. Generally speaking, the advantage of using a hair mask include:

- 1) shinier, softer hair
- 2) added moisture
- 3) reduced hair breakage and damage
- 4)less frizz
- 5)a healthier scalp
- 6)stronger hair
- 7)less environmental and product damage

4.Ideal Properties Of Antidandruff Polyherbal Hair Mask :

1. Stimulate hair growth.
2. Cleansing.
3. Remove clogging.
4. Prevent premature greying.
5. Heals dandruff naturally through regular use.
6. Strengthens the hair roots and stops hair fall.
7. Reduces occurrence of flaking and itchiness.
8. Evidence based best natural alternative to harsh anti-dandruff shampoos.
9. Makes hair strong and increases hair growth.

5. Materials and Method:

Herbs Used In Polyherbal Hair Mask:

Table 1: Ingredients Used In Polyherbal Hair Mask

Sr. No	Ingredients	Uses
1	Fenugreek 	Anti-inflammatory action, Antimicrobial, Hydrating, etc.
2	Ginger 	Maintaining clean, and healthy scalp.
3	Hibiscus 	Reducing risk of developing dandruff, Regeneration.
4	Amla 	Nourishes hair follicles, scalp, Improves blood flow.
5	Neem 	Unclog Congested Pores, Antimicrobial activity.
6	Shikakai 	Inducing hair fall, Remove oil from scalp.
7	Tulsi 	Enhanced blood circulation, Lessened itching and dryness

1) Fenugreek:

Synonym: Trigonella foenum-graecum L.

Common Name: Methi

Plant Family: Fabaceae (Leguminosae)

Chemical Constituents:

- 1) Alkaloids
- 2) Flavonoids
- 3) Saponin
- 4) Phenol

The seeds of fenugreek (*Trigonella foenum-graecum*) are composed of several chemical components. Building and repairing hair tissues require a lot of proteins, which fenugreek seeds provide in plenty. Fenugreek seeds contain nicotinic acid, a kind of vitamin B3, which is believed to enhance scalp blood circulation.



Fig 4: Fenugreek Powder

Iron, potassium, calcium, Vitamin C, and Vitamin A are just a few of the vitamins and minerals found in fenugreek seeds. These nutrients are critical for the general health of hair. These nutrients support healthy hair growth, fortify the hair shaft, and nourish the hair follicle.

Advantages:

1. Strength hair from root.
2. Treat follicular roots.
3. Fight scalp problem.

2) Ginger:

Synonym: Amomum zingiber L, Zingiber Majus Garsault

Family: Zingiberaceae

Chemical Constituents: 1) Volatile Oils

2) Flavonoids

3) Terpenoids

4) Amino Acids



Fig 5: Ginger Powder

Ginger is a fantastic hair conditioner that leaves your hair feeling smooth, lustrous, and manageable. It is also rich in minerals and essential oils. Decreases dryness, flaky scalp, and irritability. It naturally possesses antibacterial and anti-inflammatory qualities. Characteristics that support maintaining clean, healthy scalp.

Advantages:

1. Nourishes Hair.
2. Soothe the itchy and irritated scalp.
3. Having antioxidant property.

3)Hibiscus:

Synonym: Hibiscus rosa-sinensis L

Family: Malvaceae

Chemical Constituents: 1) Anthocyanins

2) Organic Acid

3) Tannin



Fig 6: Hibiscus Powder

The best component for hair is hibiscus, commonly known as “Gudal.” It treats hair loss, hair growth, and regeneration. Alpha hydroxyl acids, amino acids, alpha hydroxyl acid, both A and C, and additionally nutrients that are advantageous and may all be found in hibiscus, reduces your risk of developing dandruff and maintains the health of your scalp.

Advantages:

1. Stimulates hair growth.
2. Protects from damage.
3. Premature greying of hair.
4. Control scalp itchiness.

4)Amla:

Synonym: Emblica officinalis Gaertn.

Family: Phyllanthaceae

Chemical Constituents: 1) Ascorbic Acid

2) Pectin

3) Minerals



Fig 7: Amla Powder

Amla is a superfood that nourishes hair, follicles, and the scalp because it is loaded with vitamins and minerals. Moreover, it improves blood flow, which stops hair loss. Also, it gives the follicles Oxygen, which strengthens the fibres also has anti-inflammatory, and antibacterial qualities can help prevent dandruff.

Advantages:

- 1.Improves colour & radiance.
2. It strengthens & nourishes the roots.
3. Reduce baldness & hair loss.

5)Neem:

Synonym: Melia azadirachta L.

Family: Meliaceae

Chemical Constituents: 1) Limonoids
2) Essential Oil
3) Flavonoids



Fig 8: Neem Powder

Neem helps to cleanse the scalp. It removes clogged pores and improves hair growth. Regenerative properties are very important for the treatment of dandruff. It provide with preservatives and healing properties and can be used for a variety of hair problems. Dandruff can remove using The most common uses of Neem can be found in our hair care rituals. Promoting hair growth, reducing hair loss, and making hair more voluminous. Neem produces anti-inflammatory action.

Advantages:

- 1.Antifungal property
- 2.Antibacterial property
- 3.Reduce itchiness.

6)Shikakai:

Synonym: Acacia rugata

Family: Fabaceae

Chemical Constituents: 1) Saponin
2) Alkaloids
3) Tannin
4) Ascorbic Acid



Fig 9: Shikakai Powder

It is especially useful in combating chronic dandruff caused by excess oil on the scalp. It removes excess oil from the scalp & helps reduce dandruff during normal use. Due to its astringent qualities, tannins can help tighten and minimize oiliness in the skin. In terms of hair care, they aid in tightening the cuticles of the hair, giving the appearance of smoother, more glossy hair.

Advantages:

1. Anti dandruff agent
2. Prevents dryness

7)Tulsi:

Synonym: Holy Basil, Sacred Basil

Family: Lamiaceae

Chemical Constituents: 1) Triterpenoids

2) Phenolic compounds

3) Tannin



Fig 10: Tulsi Powder

Tulsi, or Holy Basil, has been used in religious works for centuries. Contributes to blood circulation, smoothens the scalp, reduces irritation and dandruff, and promotes hair growth. Used in the form of paste to prevent dandruff and keep the base of the scalp clean. O.Sanctum has also been investigated for various biological activities, including antimicrobial, antifungal, anti-septic, anti-stress, anti-cancer, and antioxidant activity.

Advantages:

- 1.Prevent scalp infection.
- 2.Cleanse the scalp and hair.

6.Materials:

All natural herbal ingredients such as Fenugreek, Ginger, Hibiscus, Amla, Neem, Shikakai, Tulsi.

Formulation:

Table 2: Formulation Table:

Sr. No	Ingredients	Quantity Taken
1	Fenugreek	7.5 gm
2	Ginger	2 gm
3	Hibiscus	4.5 gm
4	Amla	7.5 gm
5	Neem	4.5 gm
6	Shikakai	3 gm
7	Tulsi	1gm

7.Method:

Grinding And Mixing Method:

Preparation: First prepare the powder of herbal ingredients, all ingredients in powder form and grinded it to form a fine powder.

Weighing: Weigh all the required powder accurately, individually weighing the powder by using the digital balance.

Mixing: All the fine ingredients mixed thoroughly by mixer and make the powder.

Sieving: This fine powder was passed through sieve no. 80 and get enough of the fine powder.

Storage: The powder mixture was collected and stored in suitable container and used for doing evaluation parameter.



Fig 11: Hair Mask Powder



Fig 12: Paste For Applying Mask



Fig 13: Polyherbal Hair Mask

8.Evaluation Parameters of Herbal Hair Mask:

The prepared polyherbal anti-dandruff hair mask was evaluated by following parameters.

I. Organoleptic Evaluation

By utilizing sensory organs like eyes or nose, the examination of the formulation is performed under this evaluation, and it includes macroscopic characteristics of the drug or product, such as colour, odour, texture and appearance.

- **Colour** - A visual analysis was conducted on the hair mask's colour.
- **Odour** - The formulation was smelled in order to assess its odour.
- **pH** – Using a previously standardized digital pH meter, the pH of the solution was measured.
- **Appearance** – Fine Powder

II. Rheological Evaluation

• Angle Of Repose

It is defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow.

It required amount of dried powder is placed in a cylindrical tube open at both ends is placed on a horizontal surface. Then the funnel should be raised to form a heap. The height and radius of the heap is noted and recorded. For the above method, the angle of repose (θ) can be calculated by using the formula.

$$\Theta = \tan^{-1} (h/r)$$

Where θ – Angle of repose, h – Height of the heap, r – Radius of the base



Fig 14: Angle of repose

$$\begin{aligned}\tan \theta &= h / r \\ &= 3.5 / 5.03\end{aligned}$$

$$= 0.69$$

$$\begin{aligned}\Theta &= \tan^{-1} (h/r) \\ &= \tan^{-1} (0.69) \\ &= 34.6\end{aligned}$$

• Tapped Density

Tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 1 min and volume or mass readings are taken until little further volume or mass change was observed. It was expressed in grams per millilitre.

$$\text{Tapped Density} = \text{Mass} / \text{Tapped Volume}$$

$$\begin{aligned}\bullet \text{ Tapped Density} &= \text{Total Mass} / \text{Tapped Volume} \\ &= 30/50 \\ &= 0.6\end{aligned}$$

• Bulk Density

Bulk Density is the ratio between the given mass of a powder and its bulk volume. Required amount of the powder is dried and filled in a 50 ml measuring cylinder up to 50 ml mark. Then the cylinder is dropped onto a hard wood surface from a height of 1 inch at 2 second intervals. The volume of the powder is measured. Then the powder is weighed. This Is repeated to get average values.

$$\text{Bulk Density} = \text{Mass} / \text{Bulk Volume}$$



Fig 15: Bulk Density

• Bulk Density = Mass / Volume

$$= 30 / 68$$

$$= 0.4$$

• Hausner's Ratio

Hausner's Ratio = Tapped Density / Bulk Density

$$= 0.6 / 0.44$$

$$= 1.36$$

• Carr's Index

Carr's index = Tapped density – Bulk density $\times$ 100 / Tapped density

$$= 0.6 - 0.44 \times 100 / 0.6$$

$$= 26.6 \%$$

Table 3: Evaluation Parameters

Sr. No	Parameters	Observation
1	Colour	Faint Brown
2	Odour	Pleasant
3	Appearance	Fine Powder
5	Consistency	Powder
6	Tapped Density	0.6
7	Bulk Density	0.44
8	Hausner's Ratio	1.36
9	Carr's Index	26.6%
10	Angle of repose	34.6

9. RESULT

Colour	Light brown (depends upon herbs used)
Odor	Pleasant herbal fragrance
Texture	Smooth, paste-like
Appearance	Homogenous, Semi-solid

➤ *PH Determination*

Method: 1% solution of the hair mask in distilled water using a digital pH meter.

Result: pH between 5.5 to 6.5 (ideal for scalp and hair compatibility).

➤ *Washability*

Method: Applied to scalp model/hair sample and washed with water.

Result: Easily washable with water, no residues left behind.

➤ *Drying Time*

Method: Application on test subject and recorded time for complete drying.

Result: Approximately 15–20 minutes.

➤ *Irritancy Test*

Method: Patch test on human volunteers or skin model.

Result: No irritation or redness observed after 24 hours.

➤ *Antidandruff Activity*

Good antifungal activity indicating effective antidandruff potential.

10.CONCLUSION

This study presents several plant drugs with proven efficacy in hair care preparation. A polyherbal hair mask treats dandruff from the hair in very easy manner. Herbal based cosmetics are popular for their non-toxic nature. This hair mask helps to nourishes the skin of the scalp. Oily scalp & poor hygiene leads to dandruff in their hair. If this mask used regularly it leads to healthy & dandruff free hair. Nowadays natural remedies are in more amount in all over world, because of their safe & less side effects compared to chemical-based products. Polyherbal formulations can be prepared at home with the use of available ingredients. It is a try to prepare the polyherbal anti dandruff hair mask with the rich qualities of plants which are available easily & use for hair care formulations. Different parameters like Organoleptic evaluation, pH, studies are use for evaluation & which shows the significant result. The study of Amla & Shikakai shows the antidandruff activity.

11.REFERENCE

- 1.Rashmi S. Pal, Nikita Saraswat, Preparation and Assessment of Poly-Herbal Anti-Dandruff Formulation, The Open Dermatological Journal,2020,volume 14,1874-3722/20,pp.22-27.
- 2.<https://www.researchgate.net/publication/361809533> Formulation and Evaluation of Herbal Anti Dandruff Hair Mask.
- 3.Namrata k Durgani, Leena S. Borkar, Pratik O Gupta, Shrutika S Zade: Formulation & Evaluation of Herbal Hair Mask, vol no:11.
- 4.Pandey, A., Pandey, K. B., & Mishra, A. K. (2017). Phenolic Compounds, properties & Anti-oxidant properties in Fenugreek seeds. Food Science & Nutrition, 5(2): 270-277.
- 5.More H.N & Hazare A.A (2007), "Practical Physical Pharmacy", 1st edition 114-119.
- 6.Khandelwal K.R (2008), "Practical Pharmacognosy Techniques & Experiments", Nirali Prakashan, 19th edition,102-106.
- 7.Michel A., Naveen S., Karthika S., Sentila R., Mahenthiran R. The effectiveness of herbal & chemical agents in the treatment of dandruff in vitro. J Microbial Biotech Res, vol. 2, no. 2, 2012, pp. 916-21
- 8.S.M. Bandiul, Aslam Siddiqui, Rahul Deshkar, Shaik Nasir, In vitro study of hair mask/ Hair conditioner containing goodness of natural origin ingredients to get maximum benefits. Asian journal of management science and education volume 11 (1), January – April 2022.
- 9.Esfandiari A. and Kelley P. The effect of polyphenolic compounds on hair loss among rodents. Journal of national medical Association 2005,June: 97(6) 816-8.
- 10.Rashmi S. Pal, Nikita Saraswat, Pranay Wal and Yogendra Pal. Preparation and assessment of poly herbal anti-dandruff formulation, The open dermatology journal 2020, volume 14,1874-3722/20.
- 11.Mayurya S, Maury S. A Review on activity on herbal hair mask on hair fall. World Journal of Pharmaceutical Research. 2022;11(6):316-324.

14. Ramakrishna S, Gopikrishna UV. Formulation and evaluation of herbal hair gel. Scholars International Journal of Traditional Complementary Medicine. 2022;5(2):28-22.15. Gautam SA, Dwivei SU, Dube KU, Joshi HE.

15. Formulation and evaluation of herbal hair oil. International Journal of Chemical Science. 2021;10(1):349-353.

