



**INTERNATIONAL JOURNAL OF  
PHARMACEUTICAL SCIENCES**  
[ISSN: 0975-4725; CODEN(USA): IJPS00]  
Journal Homepage: <https://www.ijpsjournal.com>



## Research Paper

# Preparing And Evaluating Herbal Hair Serum from Flaxseed

Sweenal Chauhan\*, Vishal Chauhan, Vaishali Chaurasiya, Vikas Chaurasiya,  
Kishor Dalal, Sonali Uppalwar

*Ideal Institute Of Pharmacy, Posheri, Wada, Mumbai University.*

### ARTICLE INFO

Published: 14 May 2026

**Keywords:**

Flaxseed, Natural Hair Care,  
Hair Smoothing,  
Moisturizing, Antioxidants,  
Hair Growth, Scalp Health

**DOI:**

10.5281/zenodo.20180256

### ABSTRACT

The blue flowering crop flaxseed (*Linum usitatissimum*), which is also known by other Indian names such as linseed, Jawas, aksebija, etc., yields tiny, flat seeds that range in color from reddish brown to golden yellow. A natural solution for good hair, flaxseed (*Linum usitatissimum*), which is high in fiber, lignans, and omega-3 fatty acids, has garnered attention. In order to better understand flaxseed's potential as a hair smoothing agent, this review will focus on its moisturizing, strengthening, and nutritional qualities. Flaxseed's biologically active components, especially its high levels of antioxidants and essential fatty acids, support. The plant's ability to hydrate hair, lessen frizz, and improve texture. They also lessen inflammation on the scalp, Encourage hair growth, and shield the environment from harm. Despite the encouraging advantages, more clinical studies are required to determine the best formulations and long-term impacts. The review's conclusions highlight flaxseed as a sustainable and natural component for hair care products meant to make hair healthier, smoother, and glossier.

### INTRODUCTION

Flaxseeds, scientifically known as *Linum usitatissimum*, belong to the Linaceae family and are also known as Alsi, Jawas, and Aksebija in Indian languages[1]. The color of the seeds varies from golden yellow to reddish brown. It is made from the seeds of *Linum usitatissimum*. It's also known as linseed. Flaxseed is an important functional food element because to its high concentration of Alphalinolenic acid (ALA), an

Omega-3 fatty acid that delivers vitamins, proteins, and nutrients to the hair and scalp. Omega-3 fatty acids aid to reduce hair loss by inhibiting follicle inflammation. It stimulates circulation in the scalp, which encourages hair growth. Alpha-linolenic acid has anti-inflammatory properties and offers sustenance and nutrients to the scalp. The antioxidants produced by flaxseed are lignans. Lignans could help suppress or inhibit bacterial development. Lignans

**\*Corresponding Author:** Sweenal Chauhan

**Address:** *Ideal Institute Of Pharmacy, Posheri, Wada, Mumbai University.*

**Email** ✉: [chauhansweenal@gmail.com](mailto:chauhansweenal@gmail.com)

**Relevant conflicts of interest/financial disclosures:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



may promote hair regeneration and prevent hair loss. Vitamin E, an antioxidant found in flaxseed, helps to prevent hair loss and nourish the hair. Flaxseed is a regular source of vitamin B complex. Vitamin B complex is a set of nutrients known for growing hair stronger and healthier at a faster rate [2].

## PHARMACOGNOSY

### Flaxseed [3]

- **Biological Source:** *Linum usitatissimum* Linn.
- **Family:** Liliaceae.
- **Kingdom:** Plantae (Plants).
- **Subkingdom:** Trophobiont (Vascular Plant).
- **Subdivision:** Spermatophyta (Seed Plant).
- **Division:** Magnoliophyta.
- **Class:** Magnoliopsida (Dicotyledons).
- **Subclass:** Rosidae.
- **Order:** Linales.
- **Genus:** *Linum* L.
- **Species:** *Usitatissimum* L.

### Constituents[4]

The flax seeds contain 35-45% oil, which has 9-10% saturated fatty acids (palmitic and stearic), about 20% monounsaturated fatty acids (mostly oleic acid), and over 70% alpha-linolenic acid. Flax seeds have 20 to 30 percent protein. They are rich in nutrients and provide various health and hair benefits because they contain:

1. Protein
2. Omega-3-Fatty Acid
3. Fibers
4. Antioxidants

5. Vitamin E
6. Bioactive Compounds and Lignans
7. Vitamin B
8. Magnesium
9. Manganese
10. Selenium

### Types

The two main types of flaxseed are golden flaxseed and brown flaxseed:

#### - Golden Flaxseed (Yellow Flaxseed)

**Appearance:** Golden flaxseeds have a pale yellow to golden color and a bright, smooth exterior.

**Taste:** Compared to brown flaxseeds, golden flaxseeds have a softer, slightly sweeter, and more delicate flavor.

**Nutritional Profile:** Golden flaxseeds are rich in omega-3 fatty acids (ALA), dietary fiber, and lignans (antioxidants). While their nutritional profile is similar to that of brown flaxseeds, they may have a slightly higher omega-3 level.

#### - Brown Flaxseed

**Appearance:** Brown flaxseeds are usually reddish-brown to dark brown in color, with a deeper tone.

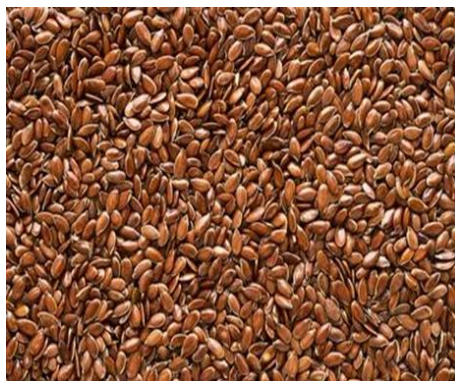
**Taste:** Compared to the lighter golden variety, brown flaxseeds have a stronger, earthier flavor. This makes them suitable for recipes that require a bolder taste.

**Nutritional Profile:** Brown flaxseeds are also rich in omega-3 fatty acids, fiber, and lignans. Both brown and golden flaxseeds are excellent sources of fiber, protein, and healthy fats, with minimal nutritional differences between them.





**Fig1: Golden flaxseed**



**Fig2: Brown flaxseed**

### Comparison of Brown and Yellow Flaxseed

Based on Table 1, the nutritional composition of brown and yellow (Omega) flax types is nearly the same. There are not many nutritional differences,

likely due to varying growing conditions. The color of the seed coat is determined by the amount of pigment present. Regular plant breeding methods can modify this characteristic.

**Table 1: List of main constituents is listed in enclosed table [5, 10]**

Constituents (in g/100g)	Brown flax	Yellow flax
Alpha-linoleic acid	58.2	50.9
Linoleic acid	14.6	15.9
Proteins	22.3	29.2
Saturated fatty acids	8.7	9.0
Oil/fats Specific fatty acids	44.4	43.6
Monosaturated fatty acids	18.0	23.5

### MECHANISMS AND MANAGEMENT OF ALOPECIA

Human hair typically goes through anagen, catagen, and telogen phases. During the anagen phase, the hair follicle actively produces cytochrome and develops the hair shaft. When the hair follicle matures, the telogen hair follicle cannot produce new hair shafts. Alopecia Areata (AA) is a recurring immune-mediated skin disorder characterized by non-scarring hair loss. It occurs in about 1.7 to 2.1 percent of the general population, with higher rates in younger patients (aged 21 to 40 years). There is no significant difference in incidence between males and females. This condition can negatively impact the quality of life, similar to other skin diseases like dermatitis and psoriasis. The pathogenesis of AA involves inflammatory cascades that break down

the hair follicle's immune privilege, with T lymphocyte invasion and an autoimmune process creating autoantigens from proteins linked to melanogenesis. Defective antioxidant defense or increased production of reactive oxygen species (ROS) may contribute to oxidative stress, which plays a significant role in many inflammatory skin disorders like AA. Several studies have shown that AA disrupts the oxidant-antioxidant balance in blood and skin tissue. Recent clinical treatments for AA mainly focus on immune regulation through various medications, including topical and systemic steroids, phototherapy, and immunosuppressants like cyclosporine and methotrexate. Certain vitamins and micronutrients may help in treating AA and reducing oxidative stress.

Flaxseed is the richest plant source of omega-3 fatty acid, specifically alpha-linolenic acid (ALA). Flaxseed oil is low in saturated fatty acids (9%), high in monounsaturated fatty acids (18%), and rich in polyunsaturated fatty acids (73%). The potential health benefits of flaxseed oil, fibers, and flax lignans include reducing risks of coronary disease, atherosclerosis, asthma, cancer, obesity, osteoporosis, autoimmune, and neurological disorders. Additionally, flaxseed is high in fatty acids and antioxidants, which help remove pollutants and dead cells from the scalp. Flaxseed gel can be added as a moisturizer for the scalp and hair, which may promote hair growth and improve the quality of existing hair. Flaxseed gel is very hydrating, has conditioning properties, and adds fluffiness without making hair crunchy.

### **COLLECTION OF FLAXSEED**

To harvest seeds from flax plants, follow these steps once the seed pods (bolls) turn brown and rattle when shaken:

1. **Harvesting:** Pull the entire plant up by the roots or cut the stalks at the base when they turn yellow-brown.
2. **Drying:** Bundle the stalks and hang them upside down or lay them on a tarp in a dry, airy spot for 1-2 weeks until the pods become brittle.
3. **Threshing:** Place the dried seed heads in a cloth bag or on a tarp, then beat them with a mallet or rolling pin to open the pods.
4. **Crushing:** Rub the broken pods between your gloved hands to release all seeds from the husks.
5. **Sifting:** Pour the mixture through a coarse sieve to remove large stems and broken pod pieces.

6. **Winnowing:** On a breezy day (or using a fan), slowly pour the seeds from one bucket to another. The wind will blow away the lighter chaff, leaving the heavier seeds behind.

7. **Storage:** Ensure the seeds are completely dry before sealing them in an airtight glass jar kept in a cool, dark place to prevent the oils from spoiling.

### **PREPARATION OF FLAXSEED EXTRACT**

1. Take 2-3 tablespoons of flaxseeds and add them to 200 ml of distilled water in a beaker.
2. Heat the mixture on a heating plate for 10-15 minutes until it forms a gel-like consistency.
3. Stir continuously to prevent sticking.
4. Once the gel forms, remove it from heat.
5. Filter the mixture through muslin cloth or filter paper to separate the flaxseed gel from the seeds.
6. Collect the flaxseed gel extract for serum preparation.

### **FORMULATION OF FLAXSEED HAIR SERUM**

1. Take the prepared flaxseed gel in a clean beaker.
2. Add aloe vera gel and mix thoroughly.
3. Slowly add glycerin while stirring continuously.
4. Pierce Vitamin E capsules and mix the oil into the formulation.
5. Add a few drops of essential oil for fragrance and scalp benefits.
6. Stir the mixture until a uniform serum is obtained.
7. Transfer the serum into a sterilized storage bottle.

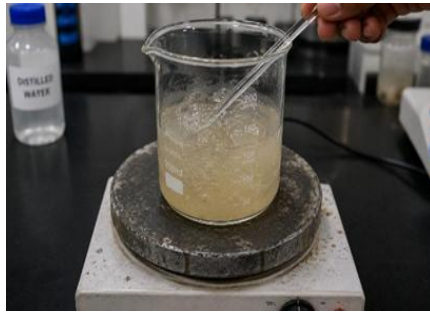




*Fig 3.*



*Fig 4*



*Fig 5.*



*Fig 6*



*Fig 7*

*Fig 3-7: Formulation of Flaxseeds serum*

## EVALUATION OF HAIR SERUM

### 1. APPEARANCE

The formulated serum was visually inspected for its color, clarity, and consistency. It exhibited a characteristic translucent, slightly yellowish-tan appearance, which is indicative of high-quality flaxseed mucilage extraction.

### 2. HOMOGENECITY

The formulation showed excellent homogeneity with no evidence of phase separation or seed debris, confirming a successful filtration and stabilization process.

### 3. pH

The pH of the hair serum was maintained between 5.5 and 6.0, aligning with the natural acidic mantle of the scalp to prevent hair cuticle swelling.

### 4. VISCOSITY

Viscosity measurements indicated a range of 1,000–3,000 cPs, providing the necessary “stringy” flow and body required for easy application. These values ensure that the serum remains stable on the hair shaft without excessive dripping or heaviness.

### 5. SPREADABILITY



Spreadability studies confirmed that the serum possesses high slip, allowing it to coat the hair fibers evenly with minimal mechanical friction

### 6. WASHABILITY

The mucilage-based base ensures superior washability, leaving no synthetic residue or greasy buildup after a standard water rinse. This makes the serum an ideal natural alternative to silicone-based products for daily hair management.

### 7. IRRITATION

The formulation was subjected to a preliminary skin irritation test, where it was found to be completely non-irritant and safe for topical scalp application

### 8. STABILITY

The stability of the flaxseed serum was evaluated by storing samples under refrigerated conditions (2° to 8°C) and ambient room temperatures (25°C to 30°C). formulation maintained its original translucency, viscosity, and homogeneity across both temperature ranges without any evidence of phase separation.

**Table 2. Evaluation parameters of herbal hair serum.**

PARAMETER	RESULT
Appearance	Translucent, yellowish-tan mucilage
Homogeneity	Completely homogenous
pH	5.8 (Slightly Acidic)
Spreadability	Excellent
Viscosity	1,500 cPs (Slightly viscous)
Irritation	Non-irritant
Washability	Easily washable with water

## RESULTS AND DISCUSSION

### APPEARANCE

Visual inspection confirmed a translucent, smooth, and yellowish-tan mucilaginous appearance characteristic of high-quality flaxseed extraction.

### HOMOGENECITY

The formulation remained completely homogenous with no evidence of phase separation or suspended seed debris, indicating a precise filtration and stabilization process.

### pH DETERMINATION

The pH was found to be within the range of 5.5 to 6.0, which is considered ideal for topical hair applications. This slightly acidic nature ensures compatibility with the scalp's natural acid mantle and prevents the swelling of the hair cuticle, thereby maintaining hair shaft integrity.

### VISCOSITY AND RHEOLOGY

The serum exhibited a viscosity of 1,000–3,000 cPs, providing a balanced “stringy” flow that is neither too watery nor excessively thick. This rheological profile allows the serum to adhere effectively to hair fibers while remaining easy to dispense from the container.

### SPREADABILITY

Evaluation of spreadability showed high values, confirming that the natural mucilage offers excellent “slip” for effortless application. This characteristic is vital for hair serums as it facilitates the mechanical detangling of hair strands and ensures an even coating across the hair surface.

### WASHABILITY

The formulation demonstrated superior washability, being easily removed with plain water without the need for harsh surfactants. Unlike synthetic silicone-based serums, this natural flaxseed matrix leaves no heavy residue or greasy buildup on the hair or scalp.

## IRRITATION

Dermatological assessment indicated that the serum is non-irritant and safe. The biocompatible nature of the flaxseed mucilage makes it an excellent hypoallergenic alternative for individuals with sensitive skin or scalp conditions.

## STABILITY STUDIES

Stability testing conducted under refrigerated (2°C to 8°C) and room temperatures (25°C to 30°C) showed that the serum remained “as is” with no physical changes. The absence of syneresis or precipitation across both temperature gradients confirms the robust thermal stability of the formulated natural polymer.

## CONCLUSION

The herbal hair serum was successfully formulated and evaluated on trial and error basis. The produced herbal hair serum offers a variety of critical nutrients that are crucial for keeping healthy hair and scalp conditions, according to the research study and outcomes shown. It contains natural components that assist hair maintenance and development. The anti-oxidant properties of herbal components including orange peel powder, hibiscus powder, and vitamin E primarily function by halting the premature greying of hair. Castor oil, fenugreek, and Flaxseeds are effective stimulators of hair growth. Hibiscus powder can be also employed as a colour agent have in this case. When compared to synthetic chemicals, the components are not dangerous. People now days are really interested in the herbal sector. Due to its strength, effectiveness, and growing use in cosmetics, the herbal business has a promising future.

The blue flowering crop flaxseed (*Linum usitatissimum*), which is also known by other Indian names such as linseed, Jawas, aksebija, etc., yields tiny, flat seeds that range in color from reddish brown to golden yellow. A natural solution

for good hair, flaxseed (*Linum usitatissimum*), which is high in fiber, lignans, and omega-3 fatty acids, has garnered attention. In order to better understand flaxseed’s potential as a hair smoothing agent, this review will focus on its moisturizing, strengthening, and nutritional qualities. Flaxseed’s biologically active components, especially its high levels of antioxidants and essential fatty acids, support. The plant’s ability to hydrate hair, lessen frizz, and improve texture. They also lessen inflammation on the scalp, Encourage hair growth, and shield the environment from harm. Despite the encouraging advantages, more clinical studies are required to determine the best formulations and long-term impacts. The review’s conclusions highlight flaxseed as a sustainable and natural component for hair care products meant to make hair healthier, smoother, and glossier.

## REFERENCES

1. Carter JF. Potential of flaxseed and flaxseed oil in baked goods and other products in human nutrition. *Cereal Food World*. 1993; 38(10):753-775.
2. Penkar GM, Salkar MR, Chavan PS, Ambade MS, Parab SA, Padte TS, et al. An overview on Indian herbs in hair care therapy. *Research Journal of Pharmacognosy and Phytochemistry*. 2023; 15(2):161-6.
3. Jujgar GS, Kale PB, Jagdale VH, Kadam PA, Jagatap KR, Jawale GR, et al. Formulation and evaluation of herbal hair mask. *Journal of Pharmacognosy and Phytochemistry*. 2024; 13(3):51-59.
4. Buffoli B, Rinaldi F, Labanca M, Sorbellini E, Trink A, Gunazirola E, et al. The human hair from anatomy to physiology. *International Journal of Dermatology*. 2014; 53(3):331-341.
5. Tyagi N, Tyagi A, Rastogi R, Singh B, Nagarajan K. Unlocking Radiance: The Dynamic Duo of Flaxseeds and Aloe Vera in



- Hair Mask for Bioactive Brilliance. *proteins*. 2023; 22:29.
6. Kaur S. Flaxseed: An emerging functional food, 2023.
  7. Fale SK, Umekar MJ, Das R, Alaspure M. A Comprehensive study of herbal cosmetics prepared from Flaxseed. *Multidiscip. Int. Res. J. Gujarat Technol.Univ.* 2022; 4:106-112.
  8. Ashiya Chaugule, Suyash Zinjad, Rahul Lokhande. Formulation and Evaluation of Protective Role of Flaxseed Gel in Hair Growth, Nourishment and Anti-Dandruff Activity. *Journal of Emerging Technologies And Innovative Research (JETIR)*. 2022 JETIR. 2022;9(6).
  9. Demir E, Acaralı N. Comparison on Quality Performance of Human Hair Types with Herbal Oils (Grape Seed/Safflower Seed/Rosehip) by Analysis Techniques. *ACS omega*. 2023; 8(9):8293-8302.
  10. Halligudi N. Pharmacological properties of flax seeds: A review; *Hygeia.J.D.Med.* 2012; 4(2).
  11. Gutte KB, Sahoo AK, Ranveer RC. Bioactive Components of flaxseed and its health benefits. *International Journal of Pharmaceutical Sciences Review and Research*. 2015; 31(1):42-51.
  12. Mukker J. Pharmacokinetic and pharmacodynamic studies on flaxseed lignans (Doctoral dissertation, university of Saskatchewan).
  13. Bernacchia R, Preti R, Vinci G. Chemical composition and health benefits of flaxseed. *Austin J Nutri Food Sci.* 2014; 2(8):1045.
  14. Soni RP, Katoch M, Kumar A, Verma P. Flaxseed composition and its health benefits. *Res. Environ. Life Sci.* 2016; 9:310-316.
  15. Murugusundram S. *Serenoa Repens*: Does It have any role in the Management of Androgenetic Alopecia. *J Cutan Aesthet Surg.* 2009; 2:31-32.
  16. Piraccini BM, Alessandrini A. Androgenetic alopecia. *J Ital Dermatol Venerol.* 2014; 149:15-24.
  17. Liang T, Liao S. Inhibition of steroids 5 $\alpha$ -reductase by specific aliphatic unsaturated fatty acids. *Biochem J.* 1992; 285:557.
  18. Humbert P, Binda D, Robin S. Beauty from inside: nutrition-based strategies in cosmetic dermatology. *Nutrition for healthy skin*, 2011, 189-196.
  19. [www.flaxcouncil.ca/english/pdf/FlxPrmr\\_4e\\_d\\_Chpt1.pdf](http://www.flaxcouncil.ca/english/pdf/FlxPrmr_4e_d_Chpt1.pdf).
  20. Aruna V, Amruthavalli GV, Gayathri R. Hair root activation by Anagen grow- a herbal hair growth serum. *Dermatol & Cosmet* 2019(3): 56-9.
  21. Begum R, Begum A. Preparation and evaluation of herbal hair oil. *Int J of Res and Anal Reviews* 2019; 6(1): 266-9.
  22. Alfredo R, Lara P, Alessandra I, et al. Evaluation of a therapeutic Alternative for telogen effluvium: A pilot study. *J Cosmetics Dermal Sci App* 2013; 3: 9-16.
  23. Gautam S, Dwivedi S, Dubey K, Joshi H. Formulation and evaluation of herbal hair oil. *Int J Chem Sci* 2012; 10(1): 349-53.
  24. Beroual K, Maameri Z, Halmi S, Benleksira B, Agabou A, Hamdi PY. Effects of *Linum usitatissimum* L. ingestion and oil topical application On hair growth in rabbit. *Int J Med Arom Plants* 2013; 3(4): 459-63.
  25. Reddy TUK, Sindhu G, Rajesh S, Aruna B, Rani KSS. Preparation and Evaluation of herbal hair oil. *Indo Am. J. pharm. Sci* 2017; 4(06): 1540-6.
  26. Sumangala BK, Kalpana P, Aishwarya T, Krithika G. Evaluation of Herbal formulations on fungal pathogens of plants: A case study. *Acta Scientific Agriculture* 2019; 3: 122-4. [<http://dx.doi.org/10.31080/ASAG.2019.03.0734>]

27. Viswanad V, Aleykutty NA, Jayakar B, Zacharia SM, Thomas L. Development and evaluation of antimicrobial herbal formulations Containing the methanolic extract of *Samadera indica* for skin Diseases. *J Adv Pharm Technol Res* 2012; 3(2): 106-11. [http://dx.doi.org/10.4103/2231-4040.97285] [PMID: 22837958]

**HOW TO CITE:** Sweenal Chauhan, Vishal Chauhan, Vaishali Chaurasiya, Vikas Chaurasiya, Kishor Dalal, Sonali Uppalwar, Preparing And Evaluating Herbal Hair Serum from Flaxseed, *Int. J. of Pharm. Sci.*, 2026, Vol 4, Issue 5, 3442-3450, <https://doi.org/10.5281/zenodo.20180256>

