

Review on Hair Cosmetics on Flaxseeds

Laxmi S. Patil^{1,*}, Lalit R. Patil¹, Hitendra S. Chaudhari², Rahul B. Lovhare²,
Roshan M. Chaudhari², S.P. Pawar³

Abstract

Worldwide cultivation of flaxseed (*Linum usitatissimum*), a significant medicinal oil seed crop, is practiced. Flaxseed belongs to the Linaceae family. Because of its biologically active components, which include lignans, dietary fiber, and alpha-linolenic acid, flaxseed has garnered interest as a functional food ingredient recently. Worldwide, Flaxseed is cultivated not only for its oil and fiber but also for its nutritional and potential therapeutic benefits. The dietary fiber present in flaxseed supports overall health and may contribute to improved hair thickness, helping to reduce the appearance of thinning hair. While hair loss is often persistent rather than temporary, it can sometimes lead to conditions, such as alopecia. Because of their severe worry and tension, a lot of people who are experiencing hair loss are looking into various therapies. Rich in fatty acids and antioxidants, flax seed helps clear the scalp of impurities and dead cells. Coconut oil might aid in sealing and moisturizing hair. They may lessen the likelihood of dandruff and a dry, flaky scalp. Recent studies have also highlighted flaxseed's anti-inflammatory and antioxidant properties, which may contribute to a healthier scalp environment, thereby promoting hair regeneration and strength. The omega-3 fatty acids in flaxseed are believed to nourish hair follicles, potentially enhancing hair elasticity and reducing breakage. Additionally, the presence of lignans may help in balancing hormonal levels, which can be a contributing factor to hair loss in both men and women. When combined with natural oils, like coconut oil, flaxseed may offer synergistic effects that improve scalp hydration, reduce irritation, and support overall hair vitality. These benefits make flaxseed a promising natural option for hair care formulations.

Keywords: Flaxseed, alpha-linolenic acid, dietary fiber, lignans, health benefits

INTRODUCTION

Flaxseed (*Linum usitatissimum*) (Figure 1) also known as linseed or common flax, belongs to the Linaceae family. In various Indian languages, it is commonly referred to as Alsi, Jawas, or Aksebija [1]. This annual plant is recognized by its blue flowers and produces small, flat seeds that can range in

color from golden yellow to reddish brown. In India, major flaxseed-producing states include Madhya Pradesh, Maharashtra, Chhattisgarh, and Bihar [2]. People have been consuming flaxseed for a very long time because of its nutritional benefits and therapeutic uses. Products made from flaxseed have been proposed as nutrient-dense additives in a variety of food items, such as ready-to-eat cereals, baked cereal goods, bread, muffins, meat extenders, and fiber bars for salad dressings [3]. Whole flaxseeds are flat and oval-shaped with pointed ends. Each seed is made up of a protective outer layer known as the seed coat or testa, a thin layer of endosperm, and two embryonic halves enclosing a central embryo axis. Almost all parts of the flax plant are used commercially, either in their natural

*Author for Correspondence

Laxmi S. Patil
E-mail: laxmipatil0806@gmail.com

¹Student, Department of Pharmaceutics, P.S.G.V.P Mandal's College of Pharmacy, Shahada, Maharashtra, India

²Assistant Professor, Department of Pharmaceutics, P.S.G.V.P Mandal's College of Pharmacy, Shahada, Maharashtra, India

³Principal, P.S.G.V.P Mandal's College of Pharmacy, Shahada, Maharashtra, India

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state or after processing [4]. Regular use of flax oil protects the gastric and urinary membranes. Flax seeds are also said to protect against arteriosclerosis and angina pectoris, as well as lowering cholesterol levels [5, 6]. Flaxseed is a crucial and prominent source of phytochemicals in the functional food industry. Flaxseed exhibits a range of other advantageous impacts, such as promoting newborn brain development, generating blood lipids, safeguarding against cardiovascular diseases, preventing cancer and diabetes, and reducing blood cholesterol levels. The amino acids present in flaxseed play an essential role in supporting hair health by helping to reduce hair loss and encouraging new hair growth [7]. The use of cosmetics dates back centuries, with people using various products to enhance their appearance, though natural beauty remains a valued trait. Flaxseed is commonly incorporated into hair care products, such as gels and oils, where it contributes to nourishment and hydration, making it a valuable ingredient in natural cosmetic formulations [8].



Figure 1. Flaxseeds.

Identity

- *Linum usitatissimum* is the name(s). *L. Family*: Linaceae, also referred to as the family of flax.
- Similar species include *L. humile* Mill and *L. crepitans* (Boenn.) Dumort (United States Department of Agriculture).
- *Common name or names*: When grown for the fiber derived from the stem, *Linum usitatissimum* is popularly known as flax; when grown for the oil extracted from the seed, it is known as linseed or oilseed flax.
- *Taxonomy and genetics*: The family Linaceae, which includes roughly 14 genera, contains approximately 230 species, of which *Linum usitatissimum* is one. Most species within the Linaceae family – around two-thirds – are part of the genus *Linum*, which includes *Linum usitatissimum*, an annual herbaceous plant known for its economic and nutritional value.

In its family, flax is the only cultivated plant, despite its amazing diversity.

- Plantae is the kingdom (plants).
- *Subkingdom*: Vascular Plants, or Tracheobionta.
- Spermatophyta is the superdivision of seed plants.
- Magnoliophyta is the division of flowering plants.
- *Class*: Dicotyledons (Magnoliopsida).
- *Rosidae*: Subclass.
- *Sequence*: Linales Family.
- *Class*: Linoceae
- *Genus*: *Linum* L.
- *Linum usitatissimum* is the species *L* [9].

NUTRITIONAL COMPOSITION

Composition

The flax seeds contain 35–45% oil which contain 9–10% of saturated fatty acids (palmitic and steric) about 20% monosaturated fatty acids (mostly oleic acid), and over 70% alpha-linolenic acid. Flax seeds have between 20 and 30 percent protein [10]. Flax seed is rich in nutrients and offers numerous health and hair benefits because it contains

- Protein.
- Omega-3-Fatty Acid.
- Fibers.
- Antioxidants.
- Vitamin E.
- Bioactive Compounds and Ligands.
- Vitamin B.
- Magnesium.
- Manganese.
- Selenium.

The best source of phytoestrogens (lignans) is flaxseed. Phenolic chemicals are abundant in flaxseeds. These phenolic compounds have well-known antioxidant and anticancer effects [11]. Flaxseed has become known as a possible functional food due to its high content of phenolic compounds, lignans, high-quality protein, soluble fiber, and alpha-linolenic acid [12]. Complete protein comes from flaxseed, which implies that all necessary amino acids are available in sufficient amounts and can be eaten to make up for protein deficiencies [13].

FLAXSEEDS – AN OVERVIEW

Pharmacology

These mechanics of the various chemical components that make up flaxseeds are still being worked out. Different qualities have been linked by studies to the plant, seed, soil, and particular plant parts. [14]. Polysaturated fatty acids, such as linoleic acid and ALA, are present in both the plant seed and oil. Additionally, they include monosaturated fatty acids, like oleic acid [15].

Effect of Antioxidant

It has been demonstrated that omega-3 fatty acids inhibit the generation of interleukin-1, tumor necrosis factor, and leukotriene B4 by neutrophils and monocytes, as well as oxygen free radicals from these cells. Lignans can function as an antagonist of the platelet activating factor receptor [16].

Inflammation/Immune Function

Due to the inclusion of EPA and docosahexaenoic acid, which reduce human neutrophil inflammatory response, flaxseed and flaxseed oil may have anti-inflammatory qualities [17]. These abilities may also be due to LTA (leukotriene epoxide hydrolase) inactivation, which reduces LTB4 formation, and platelet activating factor-stimulated chemotaxis inhibition, which is achieved by phosphatidylinositol selective phospholipase C attenuating the formation of (3H) inositol triphosphate [18].

Laxative Effect

Stretching reflexes can cause flaxseeds (not flaxseed oil) to increase volume and stimulate peristalsis, which can have a laxative effect. It seems that intestine alkalinity and stomach acid have little effect on flaxseeds. Additionally, it has been proposed that flaxseed coats and shields the gut mucosa [19], Health Benefit of Flaxseed given in Figure 2.

HAIR PROBLEMS

Hair has unusual chemical and physical properties as part of an integrated system. It is a multi-part morphological structure that functions as a single entity. The medulla is lacking in children's fine hair

and present in coarser hair, such as thick, beard, and grey hair. Asians have coarser hair than Caucasians, and their hair contains more medulla. Since the medulla offers a region of weakness and a conduit for cracks to propagate down the fiber's axis, it may be involved in the splitting of hairs [20].



Figure 2. Health benefit of Flaxseed.

Hair Impairment

The lipid layer known as 18-MEA is responsible for the hydrophobicity of hair. The fiber becomes hydrophilic when this covalently bound fatty acid is removed. Wet virgin hair can stretch up to 30% of its original length without breaking. However, stretching it beyond this limit can lead to irreversible structural damage, and if extended to around 80%, the hair is likely to break [21, 22].

Hair Scalp Infection

Dandruff is a skin ailment that causes flaky, occasionally minor symptoms on the scalp. Numerous germs and fungi that cause mental disease can also cause skin or hair issues. Antioxidant vitamin E helps your scalp feel less damaged by free radicals, which encourages the creation of new hair. Strong hair can also be supported by getting adequate vitamin E [23].

Cosmetic for Thin Hair

Prescription drugs frequently aim to increase the density of hair on the scalp. Dermatologists frequently recommend finasteride and minoxidil to induce the anagen hair phase. Nevertheless, obtaining terminal thick hair fiber is not always achievable. When paired with non-permanent cosmetic hair care treatments that may improve hair fiber diameter, many postmenopausal women may attain a better cosmetic appearance [23].

COSMETICS

The Greek term “kosmesticos,” which meaning to embellish, is the source of the English word “cosmetic.” Since then, any substance intended to enhance or promote beauty has been referred to as cosmetic. These days, cosmetics are widely accessible in the form of lotions, lipsticks, scents, eye shadows, nail polishes, hair sprays, and more. After applying a base cream, additional cosmetics, such as face powder can enhance the skin's natural glow [24]. Today, both men and women regularly use personal care products, like colognes, gels, and lotions, as part of their daily grooming routines. Flaxseed is often included in hair oil and hair gel formulations due to its ability to provide hydration and nourishment, making it a valuable ingredient in cosmetic products [25].

Flaxseeds for Hair

India has a long tradition of using flaxseed, and flaxseed preparations are prized for their healthful and nutritional qualities. Flaxseed oil contains vitamin E, which promotes new hair development and helps alleviate hair loss. robust antioxidants called lignans can promote robust, healthy hair growth. This product uses linseed oil, which nourishes the scalp from the inside out and prevent dandruff [26].

Does Flaxseed Promotes Hair Growth

In one study on animals, supplementing with ground flaxseed resulted in a 26% increase in hair length and an improvement in hair breadth. In the meantime, hair width was found to increase with both topical application of flaxseed oil and flaxseed supplementation in an animal study [27, 28].

WHY ARE FLAXSEEDS BENEFICIAL FOR HAIRS

As noted by health research sources, consuming flaxseeds can offer various medicinal benefits. These seeds are rich in fatty acids and antioxidants, which contribute to stronger, shinier hair. In many ways, flaxseeds function like a natural tonic, providing essential nutrients that support hair health. They are a good source of both macro and micronutrients, including protein, fiber, vitamin E, B vitamins, and omega-3 fatty acids. These nutrients play a vital role in maintaining the integrity of the hair cuticle – the outermost layer of the hair shaft – by enhancing its strength and protective function [29].

- *Vitamin E*: Flaxseed is a natural source of vitamin E, a powerful antioxidant that supports hair growth. It helps protect scalp tissues from oxidative damage, which can contribute to hair thinning or loss. By maintaining a healthy scalp environment, vitamin E plays a key role in promoting stronger, more resilient hair.
- *Vitamin B Complex*: Flaxseed is rich in B vitamins, a group of essential nutrients known to enhance hair strength and promote faster, healthier hair growth. These vitamins support the metabolic processes that nourish hair follicles and maintain the overall health of the hair shaft.
- *Omega-3 Fatty Acids*: Omega-3s found in flaxseed deliver essential proteins, vitamins, and nutrients to the hair and scalp. They help reduce inflammation in hair follicles, which is often linked to hair loss. Additionally, omega-3s promote better blood circulation in the scalp, potentially encouraging healthier and more consistent hair growth [30].

HOW TO USE FLAXSEED FOR HAIR?

- a. Apply Flaxseeds Oil.
- b. Apply Flaxseeds Gel.
- c. Consume Flaxseeds.

Flaxseed Oil

Flaxseed differs from whole flaxseed in that it lacks lignans and fiber. Unlike many other foods, flaxseed is considered a full-fat food, containing 73% polyunsaturated fatty acids (PUFAs), 18% monounsaturated fatty acids (MUFAs), and 9% saturated fatty acids (SFAs). One of its key components is alpha-linolenic acid (ALA), a type of omega-3 fatty acid, which makes up 55% of its total fatty acid content. Notably, flaxseed oil provides significantly more ALA than other oils, containing 5.5 times the amount per pound compared to canola and walnut oils, which are among the next highest sources [31].

Flaxseeds Mask (Gel)

A hair is an extension of the skin follicle and is defined as an “enhanced epithelial structure resulting from the pigmentation of germinative cells.” The primary material of hair, known as keratin, is composed of elements, such as carbon, nitrogen, sulfur, and oxygen [32].

BENEFITS OF HAIR MASK

Promote hair development, cleanse, clear clogs, stop graying too soon, fix damage, and have a cooling impact lessen the amount of hair fall, a healthy hairline [33].

Advantage

With its strong moisturizing properties, hair gel protects hair from heat-related or environmental damage while adding a natural shine. Serums are known to moisturize and lock in moisture, making hair feel smoother and look healthier. This makes hair healthier and less brittle. The anti-frizz qualities of hair gel also contribute to its increased smoothness.

Disadvantage

Excessive and frequent application might harm hair. This accumulates and weighs down hair after applying it regularly for a few days, giving it a very lifeless and flat appearance. On the scalp, using serum may result in irritation [34].

Consume Flaxseed

As entire flax seeds may travel through your system undigested, make sure you use ground flaxseeds. Experts advise consuming no more than two tablespoons of flaxseed every day.

Because flax seeds are high in fiber, make sure you stay hydrated when consuming them. Furthermore, abruptly increasing your fiber intake could result in gas or bloating. Therefore, it could be wiser to begin with a smaller dose and gradually increase to a few tablespoons by starting with, say, a teaspoon of ground flaxseeds every day [35].

Precautions

1. Most people can safely consume flaxseeds. However, it's advisable to stay away from them when expecting.
2. Eating raw or immature flaxseeds is not safe.
3. Given that flaxseed may decrease the absorption of medications, it could be wise to wait a few hours between taking oral medications [36].

GENERAL TIPS ON HAIR CARE

Here are a few general tips that'll help you help your hair healthy.

Treat Your Hair Gently

Induce baldness. Chemical straightening, dyeing, perming, and other hair treatments can also damage your hair. Make sure you select a reputable hairstylist if you are going to opt for them.

Give Your Hair Time to Air Dry

Use a hair dryer sparingly and only on the lowest heat setting as necessary. Your hair may get weaker and damaged by heat. In a same vein, using flat irons, curling irons, and hot combs can harm your hair.

Avoid Wearing Hairstyles That Tug on Your Hair

Hair loss can result from braids, pigtailed, ponytails, or tightly pushed back buns. This may eventually potentially lead to irreversible hair loss [37].

SIDE EFFECTS OF FLAXSEED OIL

Bloating, gas, stomach aches, and nausea can result from consuming too many flaxseeds. Consuming flaxseed is also linked to several *chronic issues*.

Possibly of Allergic Reaction

Although flaxseed is generally harmless, consuming too much of it might have several negative effects. These are essentially gastrointestinal adverse effects that might cause diarrhea, constipation, nausea, gastric distress, increased frequency of bowel motions, and abdominal discomfort. Flaxseed can occasionally be toxic if consumed uncooked or before it ripens [38].

May Cause Constipation and Fiber Overload

Overindulging in these seeds all at once raises your body's fiber load and, in rare instances, might cause diarrhea. A high fiber diet can cause intestinal and stomach blockages. It is best to consume little amounts of flax seeds together with plenty of water.

Could Raise the Risk of Cancer

Research on this topic is scarce. A flaxseed diet during lactation can lead to thyroid dysfunction because it alters thyroid hormone metabolism. To fully understand the impact of flax seeds during

pregnancy, more research is necessary. Before ingesting flax seeds while pregnant, speak with your doctor [39].

BENEFITS OF FLAXSEEDS FOR HAIRS

The nutritional makeup of flax seeds is good for hair. It not only keeps the hair hydrated but also aids in the battle against dandruff. Tell us everything there is to know about flax seeds' function in hair.

Maintain Healthy Hair

Omega-3 fatty acids, which are found in flaxseed oil, may aid to strengthen hair. It is a great source of Omega-3, which helps prevent dry hair and flaky scalp and maintain healthy hair.

Beneficial in Preventing Dandruff

Flax seed is a great anti-inflammatory component that can be used for hair because of its chemical makeup. Because flax seeds are high in amino acids, they help prevent dandruff by combating harmful microorganisms.

Increase The Suppleness in the Hair

One rich source of biotin is flaxseed. This substance has a powerful anti-aging effect on hair. Consistent application enhances the hair's texture as well as its suppleness [40].

CONCLUSIONS

Based on the reasons raised above, it can be inferred that flaxseeds' functional and nutraceutical qualities are a result of their nutritional makeup. Flaxseed plays a vital role as a significant source of phytochemicals in the functional food industry. Flaxseed oil is particularly known for its rich content of omega-3 and omega-6 fatty acids, primarily consisting of α -linolenic acid (ALA) and linoleic acid, respectively. Dandruff is a skin ailment that causes flaky, occasionally minor symptoms on the scalp. Numerous germs and fungi that cause mental disease can also cause skin or hair issues. Hair oil and hair gel formulations use flaxseed to help hydrate and nourish the cosmetics. The flaxseed hair gel compositions work wonders for treating the scalp since they strengthen the hair, which prevents hair loss. Furthermore, preventing dandruff in the hair is flaxseed hair gel. Moreover, flaxseed reduces the production of dandruff flakes and functions as an anti-dandruff agent. Because flaxseed hair gel is made by a straightforward boiling process, it is inexpensive and simple to work with. Aloe vera gel is also added to flaxseed hair gel, which helps to remove dandruff from the scalp, protect hair, and promote healthy development.

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