



Formulation And Evaluation of Flaxseed Herbal Hair Serum

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Abstract

This research project focused on developing a hair serum using natural ingredients like Flaxseed and Aloe Vera. The aim was to cater to the increasing demand for cosmetic products that not only enhance appearance but also provide medicinal benefits. In today's fast-paced world, where people are constantly seeking ways to improve their hair health and address issues like hair fall, dandruff, and dryness, natural solutions are becoming increasingly popular. Flaxseed, known for its rich nutrient content, has been traditionally used for promoting hair growth and treating dandruff. It is packed with essential fatty acids, vitamins, and minerals that nourish the scalp and strengthen hair follicles. Aloe Vera, another key ingredient, is renowned for its moisturizing and healing properties. It helps in hydrating the scalp, controlling greasiness, and strengthening hair strands. Moreover, the inclusion of Vitamin E in the formulation provides additional benefits for hair health. Vitamin E is known for its antioxidant properties, which help in repairing damaged hair and preventing further breakage. By incorporating these natural ingredients into a herbal hair serum, the aim is to create a product that not only addresses specific hair concerns but also promotes overall hair health. The significance of this research lies in offering consumers an alternative to conventional hair care products that may contain harsh chemicals. By harnessing the power of nature, this herbal formulation seeks to provide effective solutions for various hair issues while ensuring safety and sustainability. Overall, the development and evaluation of this herbal hair serum represent a step towards meeting the evolving needs of consumers in the cosmetics industry.

Keywords: Agaricus blazei Murill; monocyte-derived dendritic cells (MDDC); cell surface markers; CD1, CD11, CD14, CD40, CD69, CD80, CD86

Aim

Formulation and evaluation of hibiscus and flaxseed herbal hair gel:

Mahima Gupta, Lesha Patel, Divyesh Rohit, Rajiv Mahida
Flaxseed, also known as linseed, is referred to as Alsii, Jawas, or Aksebija in Indian languages. It's rich in nutritional fiber, protein, and fat, with its composition varying based on genetics, growing conditions, and processing methods. Its components like α -linolenic acid (ALA), lignans, and fiber offer potential health benefits, including reducing the risk of cardiovascular disease, diabetes, cancer, arthritis, osteoporosis, and neurological disorders.

Formulation and evaluation of herbal hair serum in treatment of various hair –related problems

Gayatri M.Penkar, Maithilee R.salkar, Prachi S.Chavan, Maitrey S.Ambade, Sanchit A.Parab, Manasvi M.Sawant, Dr.Vijay A.Jagap

The developed herbal hair serum appears as a pale brownish to pale reddish color with a translucent finish, which feels smooth and clean upon application.

Homogeneity: The serum exhibits good homogeneity without any visible lumps, flocculates, or aggregates.

pH: The pH of the prepared herbal serum is 7.50, which is suitable for formulation.

Viscosity: The viscosity of the prepared herbal serum was measured using a Brookfield viscometer with spindle no. 62 at various speeds (rpm) such as 50 and 100.

Microbial Contamination: After three days, the antimicrobial activity of the prepared herbal hair serum was observed, and it exhibited a zone

of inhibition of about 1-2 cm around the well-prepared.

Stability: Throughout the research period, the formulation remained physically stable with no noticeable differences in pH before and after the study. Additionally, the formulation showed stability at room temperature

Flaxseed—a potential functional food source

Priyanka kajla, Alka sharma and Dev raj sood.

Alpha-linolenic acid (ALA) is indeed the primary omega-3 fatty acid found in flaxseed, making it a valuable component of vegetarian diets. Flaxseed oil's composition, with high levels of polyunsaturated fats, moderate monounsaturated fats, and low saturated fats, contributes to its nutritional value. Essential fatty acids like ALA and linolenic acid are vital for bodily functions, as the body cannot synthesize them and they must be obtained through diet.

»Research of Formulation and Evaluation of Face Serum Containing Flax Seed Gel

Miss. Ashwini Buddhiwan Hiwale, Mr. Pawar R. K.

Flaxseed gel and face serum is a highly concentrated cosmetic product. Serum has a property of rapid absorption and ability to penetrate into deeper layer of the skin. Cosmeceuticals are skincare products that cater for both cosmetics and drugs. In this serum flax seed gel was used. Flax seed contain antioxidants, anti-inflammatory agents, and fiber.

FORMULATION AND EVALUATION OF HERBAL HAIR SERUM

Gaikwad saurabh dillip, Pawar dipak shivaji, Thorat swapnil Amrut, Yadav pratik dhanlal, Shewale gaurav sunil

The formulation of Flaxseed hair gel provides a good base for treating the scalp and strengthens the hair thereby preventing the Anti-



Clinical and Medical Research and Studies

Bacterial & Anti-Fungal. There is a further scope for pharmacological studies. In Carbopol gel formulations, the drug release was decrease with increase in Carbopol concentration because polymer concentration increases the viscosity. Stability studies in all gel formulations showed that, the physical appearance, drug content, pH, rheological properties, and drug release in all gel formulations remain unchanged upon storage for one month.

Antimicrobial activity shows that formulation of gel shows higher efficacy without any dermal irritancy.

INTRODUCTION:

Flaxseed, also known as linseed, has gained attention as a valuable ingredient in functional foods due to its high content of alpha-linolenic acid (ALA), a type of omega-3 fatty acid, lignans, and fiber. These components are beneficial for overall health, including hair health. The omega-3 fatty acids in flaxseed are particularly noteworthy for their ability to seal the hair cuticles, which can reduce hair loss and enhance hair volume.

On the other hand, aloe vera is renowned for its soothing and healing properties. It contains a variety of vitamins such as A, B12, C, and E, minerals, and amino acids. Aloe vera also contains an enzyme called bradykinase, which is known for its anti-inflammatory properties. This enzyme helps alleviate inflammation and itching, making it effective in combating dandruff.

By combining flaxseed and aloe vera in a hair styling serum, you're essentially creating a natural solution for hair care. Unlike conventional hair gels that may contain harsh chemicals and have potential side effects, this serum offers a gentler approach. It not only provides control over hair fall but also helps in the removal of dandruff, thanks to the synergistic effects of flaxseed and aloe vera. So, using such a serum can contribute to healthier, more vibrant hair without the worries of adverse effects from synthetic ingredients.

FLAXSEED:

SYNOYMS :Flax seed, linseed, Alsi or teesi (Hindi, Gujarati, and Punjabi), Ali vidai in Tamil, Atasi and Jawas in Marathi, Tishi in Bengali, Pesi in Oriya, Agasi in Kannada, Aviseginzalu in Telugu, and Cheruchanavithu in Malayalam.

BIOLOGICAL NAME: *Linum usitatissimum*

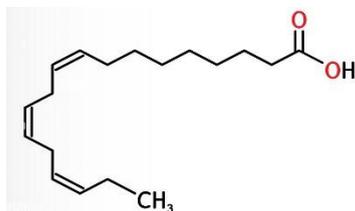
FAMILY: Linaceae

Biological Source:-

Linseed is the dried, ripe seed of *Linum usitatissimum* Linn. Linseed oil is obtained by expression of linseeds.

CHEMICAL CONSTITUENTS:

Flax consists of Pecto-cellulose. It is an abundant source of α -linolenic acid (ALA), omega-3 fatty acid, gamma-linoleic acid (GLA), viscous fibre components and phytochemicals such as lignans and proteins.



α -linolenic acid

USES:

- Omega 3 fatty acid provides vitamins, proteins and nutrients to hair and scalp.

- It promotes circulation in the scalp that may effective in hair growth.
- Lignans are the antioxidants produced by the flaxseed help to suppress or inhibit bacterial growth and help in regeneration of hair and reduces hair loss.

ALOE VERA

SYNONYM: Kumari, Aloe, Musabbar

FAMILY: Liliaceae

BIOLOGICAL SOURCE:

Aloe consists of dried juice collected by incision, from the bases of the leaves of various species of Aloe. *Aloe perryi* Baker, *Aloe vera* Linn or *Aloe barbidensis* Mil and *Aloe ferox* Miler.

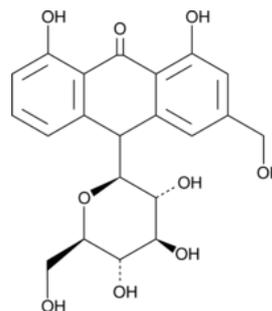
GEOGRAPHICAL SOURCE:

Aloes are indigenous to East and South Africa, but have been introduced into the West Indies.

CHEMICAL CONSTITUENTS:

The most important constituents of Aloes are the three isomers of Aloins

- Barbaloin
- B-barbaloin
- Isobarbaloin



USES:

- Aloe Vera contains minerals and many active ingredients that can help in hair strengthening.
- Aloe vera protect the scalp from Seborrheic dermatitis infection and decrease the scaliness and itchiness.
- It prevents the scalp from UV damage.
- Anti-inflammatory
- Treats stretch marks

MATERIALS AND METHODS

EQUIPMENTS USED:

1. Digital weighing balances
2. Centrifuge
3. Magnetic stirrer with hot plate
4. Digital pH meter
5. Brookfield viscometer

PREPARATION OF THE PLANT EXTRACTS USING HERBS:

FLAXSEED EXTRACT PREPARATION:

> Flaxseed mucilage was extracted by mixing the flaxseeds with water (10:200 w/v) & stirred for (0.5-8hrs) at 25-100°C. The extract was separated by filtration using muslin cloth. The mucilage solution was precipitated from the extract with 80% of any solvent in water (10:40v/v) after allowing standing for 1 hour at 4°C the precipitate was collected by centrifugation at 6000 rpm for 35 mins, homogenized in water and freeze-dried.

> We extracted the flaxseed mucilage by using different solvents. They are:

- Ethanol
- Water
- Chloroform

ALOE VERA EXTRACT PREPARATION:

> Aloe vera gel extraction involves cutting 2-4 leaves, draining out the yellow sap, and blending the mucilage until uniform. The mixture is then strained through muslin cloth and filtered before storage..



FORMULATION OF HAIR SERUM:

Formulation	F1	F2	F3	F4	F5
Flaxseed extract(ml)	3.2	6.4	9.6	12.8	16.0
Aloe vera extract(ml)	3.2	6.4	9.6	12.8	16.0
Vitamin E	1ml	1ml	1ml	1ml	1ml
Triethanolamine	1ml	1ml	1ml	1ml	1ml
Essential oil Ethanol Extract: Lavender oil	1ml	1ml	1ml	1ml	1ml
Chloroform Extract: Rose oil	1ml	1ml	1ml	1ml	1ml
Aqueous Extract: Orange oil	1ml	1ml	1ml	1ml	1ml

➤ **PREPARATION OF HAIR SERUM:**

SOLUTION 1-

1. In a beaker add varying concentrations of extract of flaxseed (F1, F2, F3, F4, F5).
2. Add vitamin E capsule to the beaker.
3. Mix the solution using magnetic stirrer for 30 minutes.

SOLUTION 2-

1. Add Aloe vera extract to another beaker and store at room temperature.

SOLUTION 3-

1. In a beaker, add solution 1 and solution 2 with continuous stirring with a stirrer.
2. To this solution, add triethanolamine that acts as a preservative and add 1-2 drops of essential oil which acts as perfuming agent.
3. Mix the solution using magnetic stirrer for 15 mins.
4. Serum is stored in a well closed container.

PHYTOCHEMICAL SCREENING:

Preliminary phytochemical screening of various solvents was performed in order to determine the presence or absence of the phytochemicals such as alkaloids, steroids, tannins, glycosides, proteins, and amino acids, the following standard procedures were used.

Test for Alkaloids

Add 1 ml of the sample solution to 1 ml of Hager's reagent. The formation of a yellow-colored precipitate signifies the presence of alkaloids.

Test for steroids

2 ml of acetic anhydride and 2 ml of concentrated sulfuric acid were added to 0.5 g of the sample. A colour change from violet to blue or green suggests the presence of steroids.

Test for flavonoids

A few drops of ammonia solution were added to the sample, followed by the layering of concentrated hydrochloric acid. The presence of flavonoids indicated by appearance of yellow color

Test for phenolic compounds

Few milliliters of gelatin solution were added to 1 ml of the extract. The

presence of a white precipitate indicates the presence of phenolic compounds and tannins.

Test for tannins

A few drops of lead acetate solution were added to 1 ml of the extract. The formation of an intense white solution indicates the

presence of tannins.

Test for cardiac glycosides

To 2ml of the sample, 2 ml of glacial acetic acid, few drops of ferric chloride solution and about 1 ml of concentrated sulfuric acid were gently layered. Brown ring indicates the presence of deoxy sugar, violet ring may appear the brown ring, and sometimes, green ring may also appear just above the brown ring.

Test for proteins

To 1 ml of the extract, add 1 ml of concentrated nitric acid, then boil and cool for a few minutes before adding about 20% sodium hydroxide solution. The appearance of an orange color indicates the presence of proteins.

Test for amino acids

A few millilitres of the sample, three drops of ninhydrin solution were added, and they were gently heated in a boiling water bath for 10 mins. The purplish blue indicates the presence of amino acids.

Test for carbohydrates

Take 2 ml of the sample in a clean and dry test tube. Add 2 ml of Fehling's solution A and Fehling's solution B to it. Place the tube in a boiling water bath for approximately 10 minutes.

EVALUATION OF HAIR SERUM:

1. Physical appearance

The physical appearance, colour and feel of the prepared herbal serum were tested.

2. Homogeneity test

A glass slide was coated with the herbal serum, covered with a glass cover, and examined under light for appearance. Visual inspection was also conducted to assess homogeneity and the presence of aggregates or particles in the serum.

3. pH

The digital pH meter was calibrated using buffer solution of pH 4 and pH 7. Then, the electrode was soaked into serum and observed until stable readings were observed.

4. Spreadability

Spreadability was measured using parallel plate method that is used to assess and measures the spreadability. Small amount of serum was pressed between two horizontal plates of dimension 20 x 20cm. the spread diameter was measured after 1 minute. Spreadability was calculated using following formula –

$$S = M \times L / T$$

Where, S = Spreadability

M = weight in the pan (tied to the upper slide)

L = Length moved by the glass slide

T = Time (in secs.) taken to separate the slides completely.

5. Stability

The prepared herbal hair serum was kept for a week at room temperature in a well closed container. The pH was determined after a week and compared with the original values.

RESULTS:

Phytochemical analysis is very useful in the evaluation of some phytoactive compounds of medicinal plants. The phytochemical screening carried on the L. Usitatissimum (flaxseeds) revealed the presence of some active ingredients.

Phytochemical screening of flaxseed extract with various solvents:

Table: 3

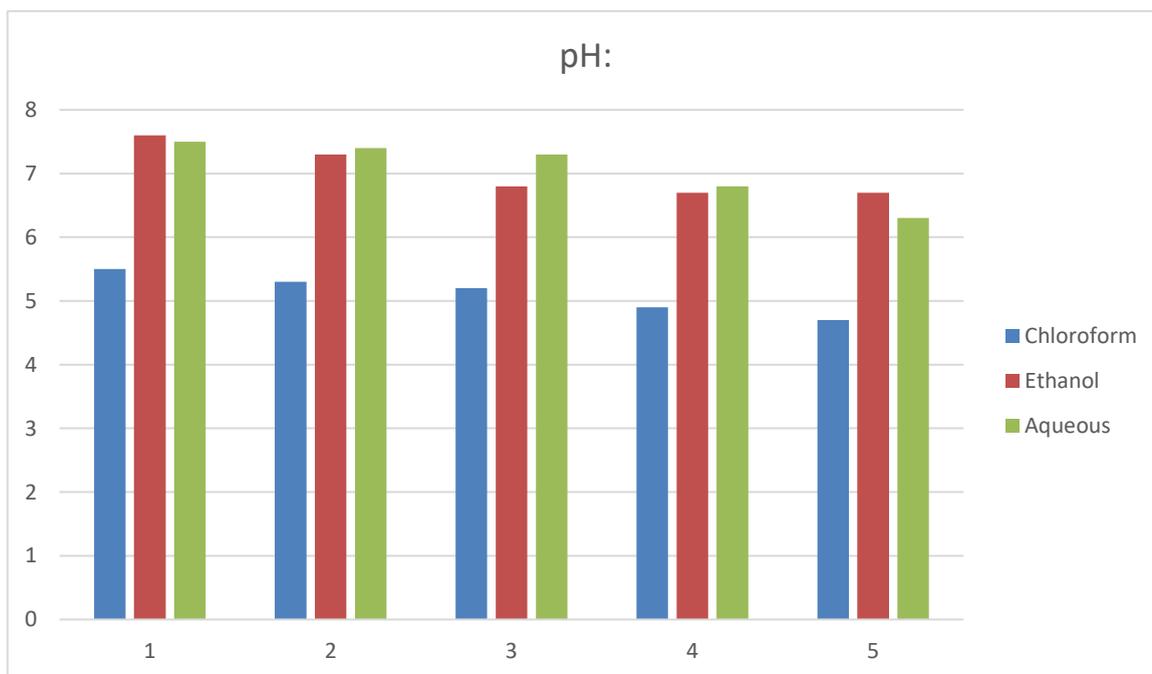


S.NO	Chloroform	Ethanol	Aqueous
1	Clear	clear	clear
2	Clear	clear	clear
3	Clear	clear	clear
4	Clear	clear	clear
5	Clear	clear	clear

pH: The pH of all the herbal formulations ranges from 4.7 to 7.6 which is appropriate and sufficient for the hair

Table: 4

S. No	Chloroform	Ethanol	Aqueous
1	5.5	7.6	7.5
2	5.3	7.3	7.4
3	5.2	6.8	7.3
4	4.9	6.7	6.8
5	4.7	6.7	6.3



Viscosity: The viscosity of prepared formulation was determined using Brookefield viscometer. The viscosity was measured at 30.0 rpm using spindle number 4.

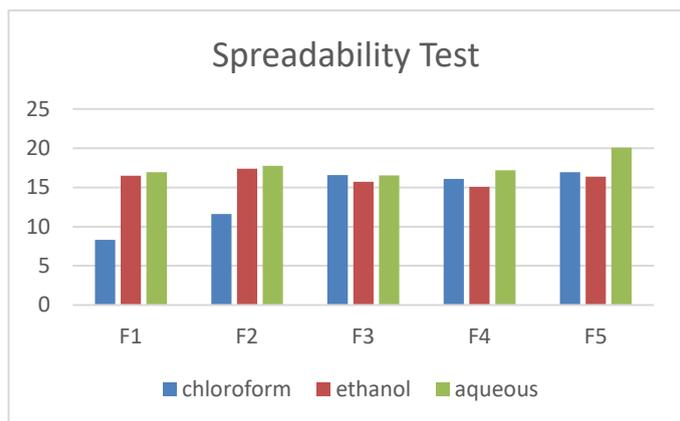


Spreadability Test:

The spreadability plays the main part in patient compliance and helps in the uniform usage of the serum. The spreadability of serum was observed to be good and easily spreadable.

Table: 5

Formulation	Chloroform	Ethanol	Aqueous
1	8.33	16.48	16.95
2	11.62	17.37	17.75
3	16.59	15.70	16.55
4	16.1	15.07	17.19
5	16.95	16.36	20.08



Stability:

The prepared herbal hair serum observed for 2 to 3 weeks at room temperature in a well closed container. The prepared formulation has shown minor changes with no physical instability, this formulation was stable at room temperature.

DISCUSSION: Flaxseed has a long history of being utilized in traditional medicine and home remedies, owing to its rich reservoir of beneficial compounds. The screening process involved in harnessing these compounds typically entails extracting phytochemicals from flaxseed through diverse solvents or methods. This screening encompasses a thorough examination of

the various bioactive compounds found within the seed, with a particular focus on lignans like secoisolariciresinol diglucoside (SDG), phenolic acids such as ferulic acid, and flavonoids like quercetin and kaempferol.

These compounds have attracted considerable attention due to their potential to promote health in manifold ways. For instance, they exhibit potent antioxidant properties, which help neutralize harmful free radicals in the body, thus protecting cells from oxidative damage. Additionally, they possess anti-inflammatory attributes, which can alleviate inflammation and associated ailments. Moreover, their anticancer effects have been explored extensively, with research suggesting their potential to inhibit the growth of cancerous cells and prevent tumor formation.

Overall, the diverse array of phytochemicals present in flaxseed underscores its significance as a valuable resource in promoting overall health and well-being.

Conclusion: Phytochemical screening of flaxseeds unveils a rich array of bioactive compounds, including lignans, phenolic acids, and flavonoids.

These compounds are renowned for their antioxidant properties, helping to combat oxidative stress and reduce inflammation in the body. Moreover, studies suggest that these phytochemicals may exert anticancer effects, potentially inhibiting the growth of cancer cells. Flaxseeds are also a plentiful source of omega-3 fatty acids, essential for heart health, and fiber, which supports digestive function and aids in weight management. The evaluation tests for the flaxseed herbal hair serum indicate promising results. It effectively retains moisture, controls frizz, strengthens hair strands, improves texture, enhances shine, and may contribute to scalp health. These findings suggest that the serum is a beneficial addition to a hair care regimen, offering hydration, manageability, and overall hair health. With its natural ingredients, it provides a holistic approach to addressing various hair concerns, making it a favorable option for individuals seeking to improve the condition and appearance of their hair.

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