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Research Article

**FORMULATION AND EVALUATION OF FLAXSEED HAIR
GEL****¹R. Madhavi Reddy, ²Gouthami M, ²U. Vyshnavi, ²Ravi. A, ³Dr. Shaik Shabeer,
⁴Dr. K. N. Venkateswara Rao**¹Associate Professor, Department of Pharmaceutics, Nalanda college of pharmacy,
Cherlapally(V), Nalgonda(D), Telangana(S) 508001.² Under Graduate Scholar, Nalanda college of Pharmacy, Cherlapally (V), Nalgonda (D),
Telangana(S), 508001.³ Head of the Department, Department of Pharmaceutics, Nalanda college of pharmacy,
Cherlapally(V), Nalgonda(D), Telangana(S) 508001.⁴ Principal & Professor, Nalanda college of pharmacy, Cherlapally(V), Nalgonda(D),
Telangana(S) 508001.**Abstract:**

India is known for traditional medicine. Herbs are the traditional form of Indian medicine which was developed by ancient sages whose astute observations led to the development of constitutional medicine. Herbal cosmetics are the preparations used to enhance the human appearance. The aim of the present research was to formulate and evaluate the herbal gel of flaxseed for the purpose of moisturizing and nourishing the hair. Flaxseed also known as linseed is full of fatty-acids and anti-oxidants which help to remove toxins and dead cells from the scalp. Four different types of gel formulations containing carbopol 940 in varying concentrations ranging from 0.5 to 2% were prepared and evaluated. The evaluation of all the formulations (F1 to F5) was done on various parameters like physical appearance, pH, viscosity, spreadibility, extrudability, homogeneity, grittiness and stability. Gels containing 0.5% and 1% of carbopol 940 formed a very thin gel that liquefied within 4 to 5 hours of preparation. With 1.5% carbopol940 the gel formation was better to some extent but the problem of liquefaction after 24 hours was observed. The gel formulation containing 2% of carbopol 940 formed uniform and smooth gel that did not liquefy even after 24 hrs. Among the four formulations, F4 showed good spreadibility, consistency, homogeneity, appearance, optimum viscosity, PH and was stable for long period of time. There is further scope to carryout animal studies also.

Keywords: Aqueous extract of flaxseed, Carbopol, Flaxseed, Hair Gel base.

Corresponding author:

R. Madhavi,
Associate Professor, Department of Pharmaceutics,
Nalanda college of pharmacy, Cherlapally(V),
Nalgonda(D), Telangana(S) 508001.
Reddymadhavireddy87@gmail.com

QR CODE



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INTRODUCTION:

Flaxseed also known as linseed is emerging as an important functional food ingredient because of its rich contents of α -linolenic acid ALA, omega-3 fatty acid, lignans, and fiber. Flaxseed oil, fibers and flax lignans have potential health benefits such as in reduction of cardiovascular disease, atherosclerosis, diabetes, cancer, arthritis, osteoporosis, autoimmune and neurological disorders. Apart from this, flaxseed is full of fatty-acids and anti-oxidants which help to remove toxins and dead cells from the scalp. Flax seed gel can be applied to scalp and hair as a moisturizer that can help to stimulate growth and improve the strength of existing hair. Topical formulations include oils, creams, ointments, pastes and gels out of which gels are getting more popular now a days because they are more stable and also can provide controlled release than other semisolid preparations. The gel formulations can provide better absorption characteristics and hence the bioavailability of drug. Gels are semisolid systems in which a liquid phase is constrained within a three dimensional polymeric matrix consisting of natural or synthetic gums in which a high degree of physical or chemical cross-linking has been introduced. Gels are relatively newer class of dosage forms created by entrapment of larger amount of aqueous hydro alcoholic liquids in a network of colloidal solid particles which may consist of inorganic substance such as aluminium salts or organic polymers of natural or synthetic origins. Most topical gels are prepared with organic polymers, such as carbopol 940, which impart an aesthetically pleasing, clear sparkling appearance to the products and are usually washed of skin with water. In the present study, flaxseed gel was prepared by incorporating aqueous extract of flaxseed into carbopol 940 gel which makes the application of flaxseed extract easy.

FORMULATION TABLE

FORMULATION CODE	F1	F2	F3	F4	F5
Aqueous extract of flaxseed	5	10	15	20	25
Carbopol 940[mg]	2	4	6	8	10
PVP[mg]	5	5	5	5	5
Methyl paraben[mg]	75	75	75	75	75
Honey[ml]	3	3	3	3	3
Triethanolamine[ml]	1	1	1	1	1
Water[ml]	20	20	20	20	20
PEG[ml]	5	5	5	5	5

MATERIALS AND METHODS:**Preparation of hair gel base**

- Prepare the mixture of polyethylene glycol, glycerin methyl paraben, were dissolved in 35 ml of water.
- flaxseeds were dissolved in warm water it is kept for heating until the thick mucilage was formed.
- The pH of above mixture was adjusted to 7.4 with triethanolamine.
- Mixture was gelled by adding 0.5% of Carbopol 940 carefully with constant stirring for 15mins.
- After stirring, the beaker containing the gel was allowed to stand in a water bath (25°C) for 15 minutes.

Preparation of flaxseed hair gel

- Collection of flaxseeds from store.
- The aqueous extract of flaxseed was prepared by adding flaxseeds to boiling water with constant stirring until the thick mucilage was formed by cold method. Then the mucilage was strained using suitable seive and stored at room temperature until further use.
- Five different herbal hair gel formulations were prepared by simple gel preparation method with carbopol gel base.

Finally varying concentration of aqueous extract of flaxseed [5%, 10%, 15%, 20%, and 25%] was incorporated in to carbopol gel and stirred for about 1 hour so as to obtain F1, F2, F3, F4 and, F5 containing 5%, 10%, 15%, 20% and 25% flaxseed extract in F4 carbopol gel formulation.

EVALUATION PARAMETERS

Homogeneity: All developed gels are tested for homogeneity by visual inspection after the gels have been set in the container. They were tested for their appearance and presence of any aggregates.

Grittiness: All the formulations were evaluated for the presence of particles if any no appreciable particulate matter was seen. Hence obviously the gel preparation fulfils the requirement of freedom particular matter and from grittiness as desired for any topical preparation.

Skin irritation test: The intact skin was used for this study. We applied the formulated gel on the skin of the human at small portion of the skin then we observed for 1 to 2 days then no irritation has been found.

Measurement of pH: The pH of flaxseed gel formulations was determined by using digital pH

meter. One gram of the gel was dissolved in 100 ml of distilled water and stored for two hours. The measurement of pH of each formulation was done in triplicate and average values were calculated.

Spreadability test: During the experiment, a test sample of a certain mass is placed on a glass plate, which is covered on top with another plate with an attached wooden block. A weight is placed on the upper plate for a while. After this, the weight is removed, a weighting agent is attached to the wooden block and the time that is needed for the upper plate to completely separate from the lower plate is measured.

Spreadability can be measured by this formula: $S = M*L/t$

Where, S- Sample for spreadability, M- wt. tied to upper slide (g), L- glass plates length (cm), t- time taken to separate.

RESULTS AND DISCUSSION:

Organoleptic properties

S.NO	ORGANOLEPTIC PROPERTY	OBSERAVATION	RESULTS
1	COLOUR	LIGHT BROWNISH	COMPLIES
2	HYGROSCOPICITY	HYGROSCOPIC	COMPLIES
3	ODOR	ODORLESS	COMPLIES

EVALUATION PARAMETERS

S.NO	FORMULATION CODE	M(gm)	L(cm)	T(sec)	S=M*L/t
1	F1	5	5	3.85	6.49
2	F2	5	5	3.4	7.35
3	F3	5	5	3.2	1.25
4	F4	5	5	6	4.16
5	F5	5	5	2.35	10.63

CONCLUSION:

The present study aimed to formulate and evaluate flaxseed loaded honey gel by cold method Flaxseed gel loaded honey was successfully formulated and evaluated by ph, viscosity, spreadability, and physical appearance. The main constituents present in flaxseeds are omega 3 fatty acids, alpha linolenic acid, and vitamins. These constituents responsible for the hair growth along with these constituents this flaxseeds also contains flavanoids, glycosides. Hence from this study it can be concluded that the formulated flaxseed hair gel is more effective compared to other gels. From these formulations we

can conclude that F5 Formulation is the best effective hair gel.

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