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HerbaDandruffGuard: Natural Solution for Dandruff-Free Hair

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Abstract: *Medicinal plants have been a major source of cure for human diseases since time immemorial. It is no wonder that the world' s one-fourth population i.e. 1.42 billion people, are dependent on traditional medicines for the treatment of various ailments. Dandruff is a skin condition with symptoms includes flaking and sometimes mild itchiness cause to the scalp. They are many bacteria, fungus causing scalp infections which lead to further hair problems or skin issues. There is one of the common conditions candidiasis which is typically caused on the skin or mucus membrane caused by candida. Herbal extract of flaxseed and guava found to be effective in treating Candidiasis. Flax seed gel has several benefits on frizzy hair. The gel is rich in omega-3 fatty acids, vitamins, minerals and Lignin which nourish the hair and promote growth. The omega- 3 fatty acids in flaxseed gel is responsible for moisturizing the hair. Herbal extract of gauva leaves, found to be effective in treating Candidiasis. Guava leaves are rich in Vitamin B & C that helps in nourishing hair and also aids hair growth. Guava leaves shows antibacterial and antifungal activity on gram positive and gram-negative bacteria. Murraya koenigii, belongs to the family Rutaceae, Commonly known as curry-leaf tree, Carbazole alkaloids, the major constituents of plant are known to have cytotoxic, antioxidant, antimutagenic and anti- inflammatory activities. The leaves are rich in mono-terpenoids and sesquiterpenoids which exhibited antimicrobial activities. Curry leaves has antibacterial antifungal and anti- inflammatory properties which fights against dandruff and infections of the scalp*

Keywords: Murraya koenigii extract, Psidium Guajava extract, Flaxseed extract, Candidiasis, omega-3 fatty acids.

I. INTRODUCTION

Recently considerable attention has been paid to utilize eco-friendly and bio- friendly plant based products for the prevention and cure of different human diseases. It is documented that most of the world' s population has taken in traditional medicine, particularly plant drug for the primary health care. Antimicrobial properties of certain Indian medicinal plants were reported based on folklore information and only few reports are available on inhibitory activity against certain pathogenic bacteria and fungi. 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.[1] Curryseed oil, fibers and flax lignans have potential health benefits such as in reduction of cardiovascular disease, atherosclerosis, diabetes, cancer, arthritis, osteoporosis, autoimmune and neurologicaldisorders.[2]

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.[3]

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.[4] 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. [5] 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

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natural or synthetic origins. This study delves into the efficacy of natural ingredients compared to synthetic counterparts in combating dandruff, aiming to provide insights into healthier and sustainable alternatives.[6]

II. MATERIAL AND METHOD

Murraya koenigii extract, Psidium Guajava extract, Flaxseed extract, HPMC, Propyl paraben, Triethanolamine, Water

COLLECTION OF PLANT MATERIAL:

The leaves of Murraya koenigii , Psidium Guajava and Flaxseed collected from local area of Maharashtra. The plant materials were taxonomically identified by plant taxonomist. Plant materials are shade dried and coarsely powdered for extraction.

PREPARATION OF EXTRACT:

Individual powders were weighed transferred into iodine flask and macerated with ethanol for 3 days by intermediate shaking. Filter the macerated powder and finally concentrate the solution to obtain extract.

PREPARATION OF HERBAL ANTIDANDRUFF GEL:

Weigh required quantity of HPMC and dispersed in 10 ml of distilled water in beaker with continuous stirring
Solution A: Take 0.5,1.0,1.5,2.0,2.5g of Guava extract respectively in A to E and add in 2 ml of Propylene glycol in one beaker and stirred properly.
Solution B: Add Flaxseed extract, curry leaves extract, and Propyl paraben in 2 ml propylene glycol in another beaker.
4.Disperse Solution A and B in HPMC with constant stirring.
Finally add remaining ml of distilled water to make up 20 ml of formulation and add Triethanolamine drop wise to the formulation until pH become neutral and gel get required consistency

Fig.No.1.-Curry Leaves Powder

Fig.No.2-Guava Leaves Powder

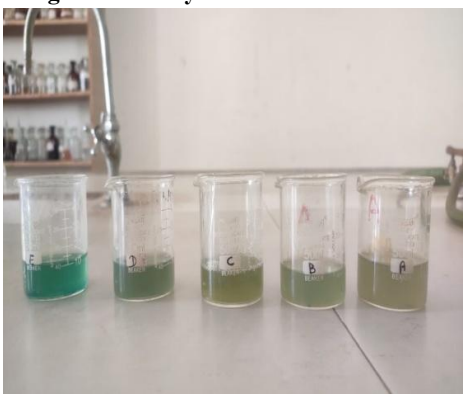

Fig.No.3-Formulation at various conc

Fig.No.4- Maceration Setup

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III. COMPOSITION OF HERBAL ANTI DANDRUFF GEL

Sr.No	Ingredients	A	B	C	D	E
1	Guava extrat	0.5g	1.0g	1.5g	2.0g	2.5g
2	Flaxseed extract	1ml	1ml	1ml	1ml	1m
3	Curry leaves extract	1ml	1ml	1ml	1ml	1ml
4	HPMC	1.5g	1.5g	1.5g	1.5g	1.5g
5	Propylamine	0.1ml	0.1ml	0.1ml	0.1ml	0.1ml
6	Triethanolamine	1-2 drops	1-2 drops	1-2 drops	1-2 drops	1-2 drops
7	Water	Q. S	Q. S	Q. S	Q. S	Q. S

IV. EVALUATION METHODS OF FORMULATION

Physical Properties: -

All the formulated herbal gels were checked for colour and homogeneity by visual observation.

pH determination: -

The pH of all the formulated herbal gels was measured by using digital pH meter.

Homogeneity: -

After the gel formulations have been set in the container, all developed gels were tested for homogeneity by visual inspection.

Viscosity determination: -

Viscosity of herbal gels was determined by using Brookfield rotational viscometer at 100rpm using spindle no. 64.

Spreadability:

The spreadbility of gel formulation was determined by measuring the spreading diameter of 1gm of gel between two horizontal plates.

Skin irritation test:

The skin irritation was carried out on human volunteers. For formulated gel, five volunteers were selected and 1.0g of formulated gel was applied on an area of two square inch to the back of the hand. The volunteers were observed for lesions or irritation.

V. RESULT AND DISCUSSION

All the formulations of herbal hair gels were studied for colour, homogeneity, pH, viscosity and spreadability.

Organoletic Properties:-

The colour of herbal gel formulation were found to be dark green with translucent appearance which was found to be smooth on application..

Colour:- Dark green

Odour:- Distinctive

Appearance:- Smooth & Homogeneous

pH Determination:

The pH of all hair gel formulations were determined by using the digital pH meter.[36] One gram of gel was dissolved in 100 ml distilled water and stored for two hours. Electrodes were completely dipped into the hair gel formulations and pH was noted. The measurement of pH of each formulation was done in triplicate and average values were calculated.

The pH of the herbal gel formulations ranged between 6.7 to 7.3 that suited the hair, indicating the compatibility of the herbal gel formulations with the hair.

Homogeneity :-

The developed gels were tested for homogeneity by visual inspection for appearance and presence of any lumps, flocculates or aggregates. The homogeneity was found to be good of herbal gel formulation.

Viscosity determination :-

Brookfield viscometer was used to determine viscosity. Sufficient quantity of gel was filled in

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wide mouth jar separately. The height of the gel in the jar should be sufficient to allow to dip the spindly. The RPM of the spindle was adjusted to 100 RPM. The viscosities of the formulations were recorded.

Viscosity is an important parameters for characterizing the gels as it effect the spreadability, extrudability and release of the drug. The viscosity of the formulations were found in the range of 25,220 to 29,510 cps. From the results it is clear that as the concentration of guava extract increased from 5% to 20% the viscosity of the formulations also increased.

Spreadability:-

Area of extent to which topical application spread on skin is called as spread ability. Topical formulations need to spread over surface of site for their therapeutic action so their efficacy depends upon its spreading value. Spreading value determination done by placing excess of sample (3g) in between two glass plates and compressed to uniform thickness by placing 1 kg weight over it for 5 minutes.

At the end weight (50g) was added to the pan and the top plate was subjected to pull with the help of string attached to the hook. The time requires to move upper plate over lower for 10 cm is recorded. Those Formulation shows lower sliding time having better spread ability.

Spreadability (S) was calculated as in Eq 1.

$$S = M.L/t \qquad \text{(Eq 1)}$$

where M is the weight (g) tied to the upper glass slide L is the length (cm) moved on the glass slide, and t is time (sec).

Spreadability plays an important role in patient compliance and help in uniform application of gel to the hair. A good gel takes less time to spread and will have high spreadability. The spreadability of formulated gel was decreased as the concentration of gelling agent increased.

Sr.No	Formulation code	Spreadability
1	F1	19.79
2	F2	22.6
3	F3	22.08
4	F4	22.29
5	F5	21

VI. CONCLUSION

Now the world market is moving towards the herbal medicines for health care and beauty care. An Indian traditional literature and ethanopharmacological study shows a number of plants have the medicinal use. From the present investigation, it has been revealed that herbal gels of plant of plant Psidium guajava,Linum usitatissimum and Murraya koenigii leaves extract can be formulated using HPMC as polymer with other ingredients and the evaluation of physical parameters shown satisfactory results

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