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FORMULATION AND EVALUATION OF HERBAL HAIR TONIC

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ABSTRACT

Nowadays, people are interested in hair preparations and conditioner materials, such as shampoos, hair tonic and conditioner formulations containing herbal extracts. Hair tonic is a product which is used to style hair. The objective of present study involves preparation of herbal hair tonic by using jojoba, tulsi, and coconut oil and its evaluation for antifungal and antibacterial activity. The final preparation of these ingredients is formulated in batches with change in concentration. Each formulation is tested for antibacterial and antifungal activity. The formulation of different concentrations were characterized for proximate analysis including moisture content, total ash, acid insoluble ash, water soluble ash, water insoluble ash, sulphated ash. The formulation gives good results for antifungal and antibacterial activity also the formulation having good consistency good spreadiability, homogeneity, appearance and pH.

KEYWORDS: Herbal formulations, antifungal activity, antibacterial activity, hair tonic, jojoba oil.

INTRODUCTION

Hair is one of the vital parts of the body derived from ectoderm of the skin, is protective appendages on the body and considered accessory structure of the integument along with sebaceous glands, sweat glands and nails.[1] The medical term for hair loss is alopecia. Alopecia can be temporary or permanent. The most common form of hair loss occurs gradually and is referred to as “androgenetic alopecia” meaning that a combination of hormones (androgens are male hormones) and heredity (genetics) is needed to develop the condition.[2] Herbal formulations always have attracted considerable attention because of their

good activity and comparatively lesser or nil side effects with synthetic drugs. Herbal cosmetics referred as products are formulated using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only, shall be called as "Herbal Cosmetics" or "Natural Cosmetics".[3] Nowadays, people are interested in hair preparations and conditioner materials, such as shampoos, Hair tonic and conditioner formulations containing herbal extracts, for prevention of hair loss.[4] The therapeutic expression for hair loss which involves losing enough hair that a person has evidently thin or hairless patches is known as alopecia. There are a number of factors that causes hair loss and baldness. Either the diet you take lacks certain vitamins or nutrients that are required for the active hair growth or some serious illness can also lead to excessive hair loss and in severe cases cause baldness. Hair oils are the hair care preparations used for the prevention and treatment of baldness or other ailments, aggression of hair. They also promote the luxurious growth of hairs. Hair oil containing herbal drugs are used as hair tonic. Hair care products are categorized into two main category, hair tonics and hair grooming aids. These are basically the extracts of medicinal plants in an oil base.[5] The medicinal plants are rich in secondary metabolites, which are potential sources of drugs and essential oils of therapeutic importance. These natural products are still used today, including essential oils such as tea tree oil and carrier oils such as jojoba oil. Like other "tonics" hair tonic is supposed to make the hair healthier. Herbal oils work through nutritional support of natural skin restorative and hair growth processes. The herbal hair oils mainly contain Amla, Aloe, Neem, Henna, Tulsi and Jojoba oils. Tulsi is used as the effective measure for hair loss and it is considered as one of the essential ingredients of herbal hair loss treatment. It is extensively used for protecting hair from falling and early graying. Tulsi seed in combination with castor oil is a useful remedy for hair lice. It also helps making the hair root stronger, thus reducing hair fall. The leaves of Tulsi contain ursolic acid, apigenin and luteolin. Some other main chemical constituents of Tulsi are Oleanolic acid, Rosmarinic acid, Eugenol, Carvarol, Linalool.[6] Tulsi contains antioxidants, which neutralize the harmful effects of free radicals, and thus arrest aging.[7] Jojoba oil has hair stimulating activity hence it is important. Jojoba oil is certainly one of the most popular as well as well-known oils with regards to herbal hair loss solutions. What tends to make it so well-liked is that it can be easily mixed with any other oil such as coconut oil and bring about remarkable outcomes for individuals suffering from loss of hair? The resulting blend of these herbal oils makes an extremely effective hair tonic. Jojoba Oil originated in the American southwest were native

Americans have long known of its potent cosmetic and medical properties. It's been dubbed "solid gold" for the skin due to a variety of uses.

MATERIAL AND METHODS

Preparation of extracts

Fresh leaves of Osmium sanctum were washed under tap water & then kept for 36 hr. for drying. After drying those leaves cut into small pieces 10 gm of small pieces are weighed & these pieces are then fed to the stirred type batch reactor with 150 ml of methanol. The speed of agitation was kept at 500, 700, 1000 rpm the extracted sample at known interval of time was collected.

Herbal hair tonic formulation

For the formulation of herbal hair tonic Jojoba oil and Tulsi oil used as active constituents and coconut oil is used as base of formulation. Jojoba oil is easy to mix with Tulsi oil hence firstly both the oils are mixed together in a separate beaker, in another beaker coconut oil is added then mixture of jojoba and tulsi is added in beaker containing coconut oil. Coloring and perfume is added for increasing attractiveness of formulation. Finally it is stirred on mechanical shaker for proper mixing and consistency of formulation.

FORMULATIONS

Table No. 1 Formulation.

Ingredients	F1	F2	F3	F4	F5	F6
Tulsi oil %v/v	0.1	0.2	0.3	0.4	0.5	0.6
Jojoba oil %v/v	0.4	0.5	0.6	0.7	0.8	0.9
Coconut oil q.s. (ml)	10	10	10	10	10	10
Coloring agent	q.s.	q.s	q.s	q.s	.q.s	q.s.
Perfume	q.s.	q.s	q.s	q.s	.q.s	q.s.

Evaluation of herbal hair tonic

pH of formulation

1ml of the oil was weighed in a test tube. 9 ml of water was added. pH of the mixture was determined with the help of a pH meter.

Viscosity

Viscosity was measured with Brookfield digital viscometer at 100 rpm.[8]

Homogeneity

The formulations were tested for the homogeneity by visual appearance and by touch.

Appearance

The appearance of the formulation was judged by its colour, odour and consistency.

Removal

The ease of removal of the formulation applied was examined by washing the applied part with tap water.

Spreadability

Spreadability was determined by modified wooden block and glass slide apparatus. The apparatus consisted of a wooden block, with fixed glass slide and a pulley. A pan was attached to another glass slide (movable) with the help of a string. For the determination of Spreadability excess amount of the cream was placed on the fixed glass slide. The movable glass slide with a pan attached to it was placed over the fixed glass slide and 1 kg weight was placed on it for 5 minutes. 50 g of weight was added to a pan and time taken for the slides to separate was noted.

Formula

$$S = W \times L/t$$

Where,

S = Spreadability,

W = Wight tied to upper slide,

L = Length of slide.

Acid value

Take 10 gm of substance dissolved in accurately weighed, in 50 ml mixture of equal volume of alcohol and solvent ether, the flask was connected to reflux condenser and slowly heated, until sample was dissolved completely, to this 1 ml of phenolphthalein added and titrated with 0.1 N NaOH, until faintly pink color appears after shaking for 30 seconds.

$$Acid\ value = n \times 5.61/w$$

Where,

n =the number of ml of NaOH required.

w =the weight of substance.

Saponification value

It represents the number of milligrams of potassium hydroxide required to saponify 1 g of fat under the conditions specified. It is a measure of the average molecular weight (or hain length) of all the fatty acids present.

$$Number\ of\ moles = \frac{mass\ of\ oil}{relative\ atomic\ mass}$$

Formula

$$Saponification\ Value = 28.05 \times \frac{b - a}{weight}$$

Where,

b= blank reading

a= sample reading.

Evaluation of different batches of herbal lotion.

Table No. 2 Evaluation parameters of all formulation.

Formulation	Consistency	Texture	Spreadability	Washability	Skin irritation	pH	Viscosity
F1	Poor	Smooth	Poor	Poor	No	5	0.0164
F2	Poor	Smooth	Poor	Poor	No	5	0.0164
F3	Good	Smooth	Good	Good	No	5	0.0173
F4	Good	Smooth	Good	Good	No	5	0.0181
F5	Good	Smooth	Good	Poor	No	5	0.0186
F6	Excellent	Smooth	Good	Poor	No	5	0.0191

Evaluation of antifungal activity

1) Fungus *Aspergillus niger* and *Candida albicans* were used in the present study determine the antifungal activity of the herbal oil by agar diffusion method (cup plate method).and standard used is Grisofulvin (100 µg/ml).

2) In the agar diffusion method, nutrient agar for antifungal activity was used as culture media and cavity were aseptically made over the culture plates using borer (9 mm internal diameter).

3) The cavities were filled with formulation F6, standards and control. The plates were incubated at 37°C for 24 hrs.

4) The activities were determined by measuring the diameter of the zone in mm.

5) The experiment was replicated two times to confirm the reproducible results.

Evaluation of antibacterial activity

1) Bacteria *Escherichia coli* were used in the present study to determine antibacterial activity of the herbal oil by agar diffusion method (cup plate method). And the standard used is Penicillin (100 µg/ml).

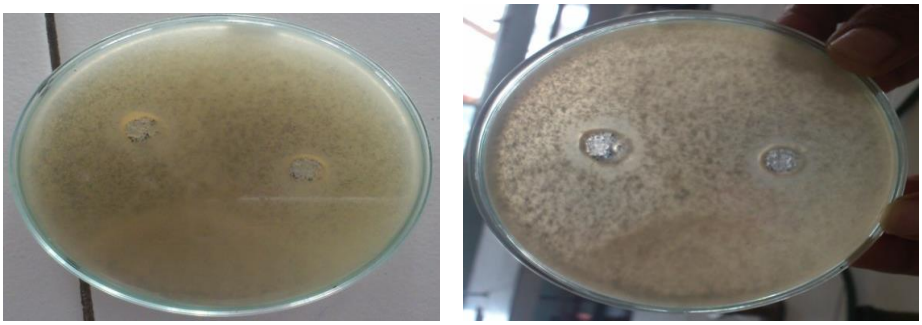
2) In the agar diffusion method, nutrient agars for antibacterial activity were used as culture media and cavity were aseptically made over the culture plates using borer (9 mm internal diameter).

3) The cavities were filled with formulation F6 standards and control. The plates were incubated at 37°C for 24 hrs.

4) The activities were determined by measuring the diameter of the zone in mm.

5) The experiment was replicated two times to confirm the reproducible results.[9]

Result showing antifungal activity of formulation F6 and standard on Aspergillus niger.

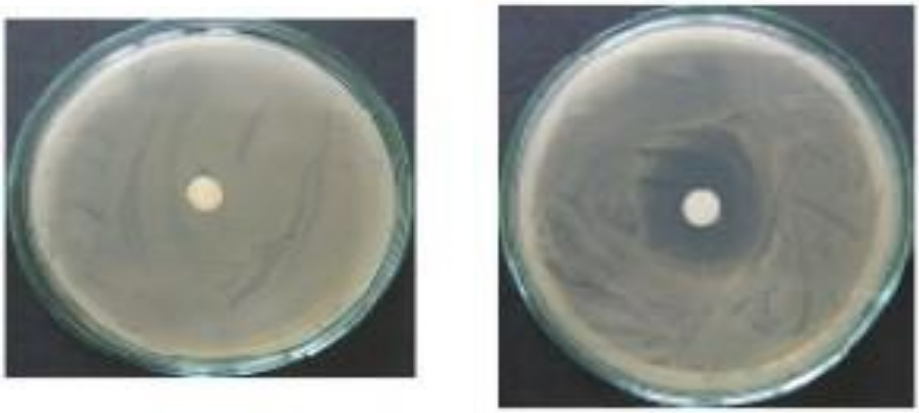


Antifungal activity of formulation Antifungal activity of standard.

Result showing antifungal activity of formulation F6 and standard on Candida albicans.

Antifungal activity of formulation Antifungal activity of standard.

Result showing antibacterial activity of formulation F6 and standard on E. coli.



Antibacterial activity of formulation Antibacterial activity of standard.

Zone of inhibition values at different concentrations of herbal Hair Tonic.

Name of the organism	Concentration (ml)	Zone of inhibition (cm)	
		Formulation F6	Standard (100 µg/ml)
Aspergillusniger	0.1	1.02	1.21
	0.2	1.08	1.32
Candida albicans	0.1	0.87	1.78
Escherichia coli	0.1	0.10	2.52

RESULT AND DISCUSSION

The present research work was conducted to develop a topical formulation herbal hair tonic. The antifungal & and antibacterial activity of tulsi oil and hair growth stimulating activity of jojoba oil are already established by various research groups (literature survey) on its application on hair. Therefore the formulation development was undertaken so as to provide these pharmacological activities on topical application. In this formulation all ingredients are oil in nature so there is no problem of phase separation homogeneous formulation with good consistency is formulated. Thus the formulation was satisfactory with respect to pharmaceutical elegance. Therefore the results of antifungal &antimicrobial studies revealed that the overall activity of formulation was comparable and even better.

CONCLUSION

Throughout the development process the formulations were subjected to, microbiological evaluations final formulations evaluated for parameters like consistency, texture, spreadability, washability and skin irritation. All these preliminary parameters were satisfactory. The pH values of the final formulations were near to the pH range of skin and within the range specified in the Indian Standard Specification. Antifungal and antimicrobial

activity of formulation F6 shows significant activity when compared with standard. Plant based products have been effectively proven for their utilization as source for antimicrobial and antifungal compounds.

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