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FORMULATION AND EVALUATION OF HERBAL HAIR TONIC

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ABSTRACT:

Nowadays, shampoos, hair tonics, and conditioner formulations using herbal extracts are popular hair preparation and conditioner products. A product called a hair tonic is used to style hair. The goal of the current study is to make a herbal hair tonic utilising castor, clove, and coconut oil and to test its efficacy against germs and fungi. These materials are combined in batches with varying concentrations to create the final product. Antibacterial and antifungal activity is assessed for each formulation. For proximate analysis, the formulation of various concentrations was described in terms of moisture content, total ash, acid-insoluble ash, water-soluble ash, water-insoluble ash, and sulphated ash. The formulation has good consistency and spreadability and provides good results for antifungal and antibacterial activities.

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

I. INTRODUCTION

The term 'Hair Tonic' has been used for some hair preparation because the term is used in therapeutics. Hair tonic is one kind of hair repairing tonic and retexturing the hair.

There are two distinct types of products:

1. Products those deals with specific problem of hair. Eg: greasy hair, dandruff.
2. Products which are intended for improving, restoring and maintaining the condition of hair.

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 clove 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, clove and castor oils. Castor oil 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. Castor oil contains ricinoleic acid and fatty acid .[6] Castor oil contains antioxidants and anti-inflammatory activity, which neutralize the harmful effects of free radicals, and thus arrest aging.[7] Clove oil has hair stimulating activity hence it is important. Clove oil is certainly one of the most popular as well as well-known oils with regards to herbal hair loss solutions.

II. Material and methods:

Herbal hair tonic formulation: For the formulation of herbal hair tonic Castor oil and Clove oil used as active constituents and coconut oil is used as base of formulation. Castor oil is easy to mix with Clove oil. Hence, Firstly both the oils are mixed together in a separate beaker, in another beaker coconut oil is added then mixture of Castor and Clove is added in beaker containing coconut oil. Perfume is added for increasing the attractiveness of formulation. Finally, it is stirred on mechanical shaker for proper mixing and consistency of formulation[8].

III. FORMULATION TABLE:

Table No. 1: Formulation of herbal tonic

Ingredients	F1	F2	F3	F4	F5	F6
Castor oil	0.1	0.2	0.3	0.2	0.1	0.2
Clove oil	0.2	0.1	0.2	0.3	0.4	0.2
Eucalyptus oil	0.2	0.3	0.3	0.1	0.3	0.2
Almond oil	0.5	0.4	0.2	0.4	0.2	0.4
Coconut oil	9	9	9	9	9	9
Perfume	q.s	q.s	q.s	q.s	q.s	q.s
Total	10	10	10	10	10	10

IV. 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[9]

Viscosity

Viscosity was measured with Brookfield digital viscometer at 100 rpm.[9]

Homogeneity

The formulations were tested for the homogeneity by visual appearance and by touch[9].

Appearance

The appearance of the formulation was judged by its colour, odour and consistency[9]

Removal

The ease of removal of the formulation applied was examined by washing the applied part with tap water[9].

Spread ability

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 = Weight 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 [9].

$$\text{Acid value} = n \times 5.61 / w$$

Where,

n = the number of ml of NaOH required.

w = the weight of substance.

V. Formulation and Evaluation of different batches of herbal tonic:

Formulations of all herbal tonic were shown in figure no.1:



Figure No.1: Formulations of all herbal tonics

VI. Evaluation parameters of all formulation:

All the evaluation parameters of herbal tonic were done and results were shown below the table no.2:

Table No. 2 Evaluation parameters of all formulation.

Formulation	Consistency	Texture	Washability	Skin irritation	pH	Viscosity	Spreadability
F1	Good	Smooth	Poor	No	5.1	2.6577	Good
F2	Poor	Smooth	Good	No	5.1	2.6583	Good
F3	Good	Smooth	Good	No	5.2	2.7843	Good
F4	Good	Smooth	Poor	No	5.2	2.7943	Good
F5	Good	Smooth	Good	No	5.2	2.8377	Good
F6	Excellent	Smooth	Good	No	5.3	2.8477	Good

Note: After the evaluation of all formulations, it was found that F6 formulation has better consistency, pH, viscosity and spreadability as compared to other formulations. So, F6 formulation was taken for further antimicrobial and antifungal studies.

VII. Evaluation of antifungal activity

- 1) Fungus *Aspergillus niger* 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. [10]

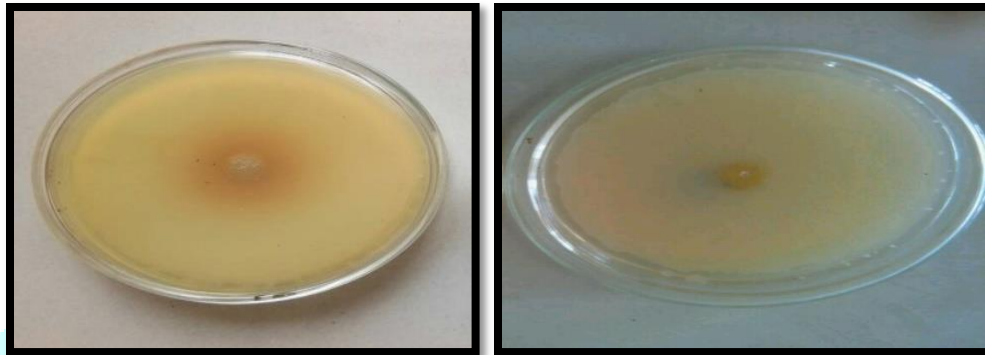
Result showing antifungal activity of formulation F-6 and standard on *Aspergillus niger*.

Figure no.2. Antifungal activity of F-6 formulation and standard.

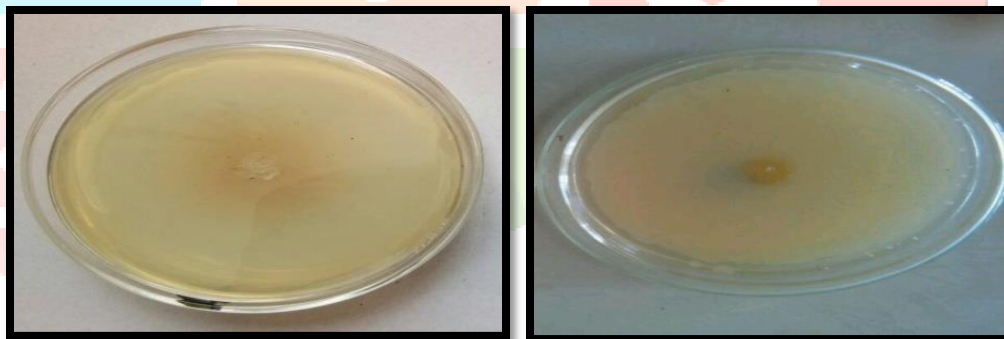
Result showing antibacterial activity of formulation F6 and standard on *E.coli*.

Figure no.3. Antibacterial activity of formulation and standard

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

Name of organism	Concentration(ml)	Zone of inhibition (cm)	
		Formulation F-6	Standard (100µg/ml)
<i>Aspergillus niger</i>	0.1	1.02	1.21
	0.2	1.08	1.32
<i>E.coli</i>	0.1	0.10	2.52

VIII. RESULT AND DISCUSSION

The goal of the current research was to create a herbal topical hair tonic. Numerous research teams have already proved the antifungal, antibacterial, and hair-growth-stimulating properties of castor oil and clove oil when applied to hair (literature survey). In order to deliver these pharmacological actions for topical administration, formulation development was done. Since all of the constituents in this formulation are oils, phase separation is not an issue. Instead, a homogenous formulation with acceptable consistency is created. As a result, the formulation met pharmaceutical elegance requirements. The total activity of the formulation was therefore comparable to or even better, according to the results of antifungal and antimicrobial experiments.

IX. CONCLUSION

Microbiological tests were performed on the formulations throughout the development process, and the final formulations were assessed for characteristics like consistency, texture, spreadability, washability, and skin irritancy. All of these introductory factors fulfilled expectations. The resulting formulations' pH values fell within the Indian Standard Specification's permitted range and were relatively close to the pH range of skin. When compared to standard, the antifungal and antibacterial activity of formulation F6 exhibits substantial activity. The use of plant-based products as a source for antibacterial and antifungal chemicals has been successfully demonstrated.

X. REFERENCES:

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