FORMULATION AND EVALUATION OF POLYHERBAL HAIR OIL

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ABSTRACT

Herbal cosmetics are now widely used by the common people because of the concept of fewer side effects and a better safety and security profile. Herbal formulations are known for their use since ancient times with minimal side effects and enhanced activity due to their origin. Hair is one of the vital parts of the body derived from ectoderm of skin, is a filamentous biomaterial that grows from follicles found in the dermis and also a protective appendages on the body. All natural nourishing preparations for dry scalp and hair combines herbal oil extracts traditionally used to treat hair conditions. These oils are used to treat hair problems like thinning of hair and dry or flaky scalp. Apart from their moisturizing purposes they are also used to promote hair growth, improve circulation of blood in the scalp, and prevent dandruff. The aim of present work is to formulate herbal hair oil fromthe leaves, flowers, fruits, seed and roots of herbal plants in coconut oil. The formulated hair oil was evaluated for different properties such as phytochemical tests, specific gravity, saponification value, skin irritation test, Peroxidevalue, pH, HPTLC. In future it can be used for treatment of various scalp and hair treatments and improve the hair texture.

Keywords: Phytoconstituents, Polyherbal, Formulation, Evaluation

INTRODUCTION

Herbal formulation is an ancient methodology because its origin of was found in the holy Vedas and in Unani scriptures. A large number of herbal oils have been formulated till date, of which very few are reported to show maximum activity [1, 2]. Polyherbal hair oil not only moisturizes scalp but also reverse dry scalp

and dry hair conditions. Herbal cosmetics were gaining tremendous demand in the world market. There is a wide range of herbal cosmetic products used as beauty regime to satisfy the purpose of beautification. Adding herbs in cosmetics is safer for our skin. Herbal hair oils were serving the purpose of hair treatment **[3, 4]**. Herbal hair oil not only moisturizes scalp but also reverses dry scalp and dry hair conditions. It provides numerous essential nutrients required to maintain normal functions of the sebaceous gland and promote natural hair growth **[5]**.

There are two categories of hair care products. They are hair tonics and hair grooming aids. Hair oil those containsherbal drugs are called as hair tonics. These are formulated by herbal extracts in an oil base. Hair oils are the hair care formulations applied for treatment of hair disorders such as baldness, greying of hairs, hair falling, anddryness of hairs **[6]**.

MATERIALS AND METHODS

Raw Materials

For the preparation of polyherbal hair oil various plant materials were collected viz., Amla, Fenugreek, Hibiscus, Neem, Curry leaves, Ashwagandha, Brahmi, Coconut oil from the local market **[7] (Table 1 & 2)**.

Table 1: Ingredients name and its uses

S. No	Ingredients Name	Uses
1	Amla (*Embilica officinalis*)	Hair conditioner, treats scalp ailments, promotes hair growth.
2	Methi (*Trigonella foenumgraecum*)	Prevent baldness, contain nicotinic acid whichencourages hair growth and lecithin with energizing hair follicles [8]
3	Hibiscus (*Hibiscus Rosa sinensis*)	Hibiscus consists of calcium, phosphorus, iron, copper, zinc, vitamin etc. used to stimulate thicker hair growth by strengthening the strands and prevents premature graying of hair.
4	Neem (*Azadirachta indica*)	Neem contains several fatty acids such as linoleicacid, stearic acid, oleic acids that nourishes and revitalize rough hair to a smooth silky texture[9]
5	Curry leaves (*Murraya koenigii*)	Antibacterial, Antiseptic, Antifungal anti-inflammatory properties which fights againstdandruff and infections of the scalp
6	Ashwagandha (*Withania somnifera*)	Ashwagandha has antioxidant and hormonebalancing properties which reduces hair fall and promotes shiny hair
7	Brahmi (*Bacopa monnieri*)	Brahmi contains alkaloids which enhance protein kinase activity and relieve stress [9]
8	Coconut oil	Vehicle, relieve Skin Irritation etc

Formulation of polyherbal hair oil

Herbs of all the crude drugs are collected and dried under shade. The dried crude drugs were made into coarse powder by using mixer. Later on all these coarsely powdered drugs are passed through mesh number 80. Thus obtained powders are blended together to get a uniform mixture. Now coconut oil is added and mixed well. Now the contents were boiled for 15 min and were filtered through muslin cloth. To the filtrate coconut oil was added tomake up the

volume. Finally small amount of flavouring agent was added to the oil and it was placed in amber coloured bottle **(Table 2) [10]**.

Table 2: List of ingredients used for Polyherbal hair oil preparation

S. No.	Ingredients	Part used	Quantity
1	Amla	Fruit	9gms
2	Fenugreek	Seed	9gms
3	Hibiscus	Flowers	9gms
4	Neem	Leaves	9gms
5	Curry Leaves	Leaves	9gms
6	Ashwagandha	Root	9gms
7	Brahmi	Leaves	9gms
8	Coconut oil	Kernel	100ml

Evaluation of Polyherbal Hair Oil

Organoleptic Property:

Different organoleptic properties like Colour, physical state, odour, and solubility was determined manually **[11]**.

Phytochemical Evaluation:

Phytochemical analysis of secondary metabolites was performed for checking presence of (Tannins, Glycosides, Terpenoids, Steroids, Anthocyanin, Flavonoid, Alkaloid, Saponins) as well as Biochemical testing for Carbohydrates Proteins and Fats in Herbal oil was carried out by performing preliminary colour-based test **[12]**.

Physicochemical Evaluation:

The prepared formulation was subjected for physical studies like pH, Specific gravity, Saponification value, Acid value, Peroxide value **[11]**.

Heavy metal determination:

Heavy Metal analysis was done to check if any heavy metals are present in the formulation **[13, 14]**.

UV Spectrophotometry:

The methanolic extract of formulation was analysed under UV Spectrometer ranging on various wavelength from 200nm up to 700nm. The UV was analysed twice once full scan and then 210nm to 270nm to get exact maximum absorbance **[15]**.

Preparation of Sample

All the raw materials and prepared formulation were dissolved in Methanol and kept overnight. Extracts were collected by filtering the solution by Whattman filter paper to obtain clear extracts **[16]**.

High Performance Thin Layer Chromatography

10µl of the filtered solution of formulation extract and standard was applied on the HPTLC plate as per conditions mentioned below. The same conditions were maintained while studying stability studies of the formulation. The optimum conditions **(Table 3)** were maintained while performing HPTLC Fingerprinting **[17, 18]**.

Table 3: Conditions for HPTLC [19,20]

Stationary Phase	HPTLC Plate silica gel 60 F 254
Plate Size	10.0×10.0 cm
Mobile Phase	Toluene: Ethyl acetate: Formic acid
Saturation time	20 min
Spot Volume	10µl
Band length	8.0mm
Solvent Front	80mm
Wavelength and lamp	276 and mercury lamp
Sample Applicator	CAMAG Linomat 5
Sample Detection	CAMAG Visualizer: 200480
Number of tracks	09

RESULTS AND DISCUSSION

The polyherbal hair oil formulation was prepared as per Ayurvedic Formulary of India. The prepared polyherbal hair oil using the above mentioned ingredients [21]. It was evaluated for the following parameters and the results are tabulated, their importance of organoleptic properties such as colour, physical state, and odour mentioned in (Table 4). The different phytochemical properties like Tannin, Glycoside, Alkaloid, flavonoid, steroid, Sterol are present in (Table 5) [22]. The various parameters like sensitivity test, PH, Specific gravity, Saponification value and Acid value, peroxide value of polyherbal hair oil testing is done for determination of presence of primary and secondary metabolites (Table 6). The determinations of heavy metal are performed to check the presence of heavy metals in the formulation (Table 7) [23]. UV visible spectrophotometry was determine to check the maximum absorbance show in (Table 8, 9 and Figure 1, 2) In HPTLC it shows presence of raw material with formulation with standard (Figure 3). Hence from the present investigation and biological screening establishes the efficacy of formulated polyherbal hair oil [24, 25].

HPTLC Fingerprinting (Figure 3)

Standard: 10ppm Tannic acid [45]

Table 4: Organoleptic Evaluation of Polyherbal hair oil

Colour	Dark brown
Physical state	Liquid with greasy in nature
Odour	Characteristics odour with coconut oil [27]

Table 5: Phytochemical Evaluation of Polyherbal hair oil

S. No.	Test	Am	Fe	H	N	C	As	B	F
1	Tannin	+	+	+	-	-	-	+	+
2	Glycosides	-	-	-	+	-	+	+	+
3	Terpenoid	-	-	+	-	+	-	+	-
4	Alkaloid	+	+	+	-	+	+	+	+
5	Flavanoid	+	-	+	-	-	+	+	+
6	Steroid	+	-	+	-	+	+	+	+
7	Saponin	-	-	-	-	-	-	-	-
8	Phenolic compound	+	-	+	+	-	-	-	-
9	sterol	+	-	-	-	+	+	-	+
10	Anthrocyanine	-	-	+	-	-	-	-	-
11	Carbohydrate	-	-	-	-	-	-	+	-
12	Starch	-	-	-	-	-	-	-	-

Key: (+) Present, (-) Absent Am – Amla, Fe – Fenugreek, H – Hibiscus, N – Neem, C – Curry leaves, As –Ashwagandha, B – Brahmi, F – Formulation [28, 29]

Table 6: Physicochemical Evaluation of Polyherbal hair oil [30]

S. No.	Tests	Value
1	pH	6.5
2	Specific gravity	0.9148
3	Saponification value	210.3 KOH/g
4	Acid value	1.346 mgKOH/g
5	Peroxide value	4.0 Meq/Kg
6	Sensitivity Test	Not sensitive

Table 7: Heavy metal determination of Polyherbal hair oil

TEST	RESULTS
Bismuth	-
Chromium	-
Copper	-
Cadmium	-
Nickel	-
Zinc	-
Cobalt	-
Lead	-

Key: (+) Present, (-) Absent

Table 8: UV Spectra

Wavelength	Absorbance
200	0.954
250	1.386
300	1.171
350	0.795
400	0.513
450	0.52
500	0.486
550	0.464
600	0.414
650	0.402
700	0.393
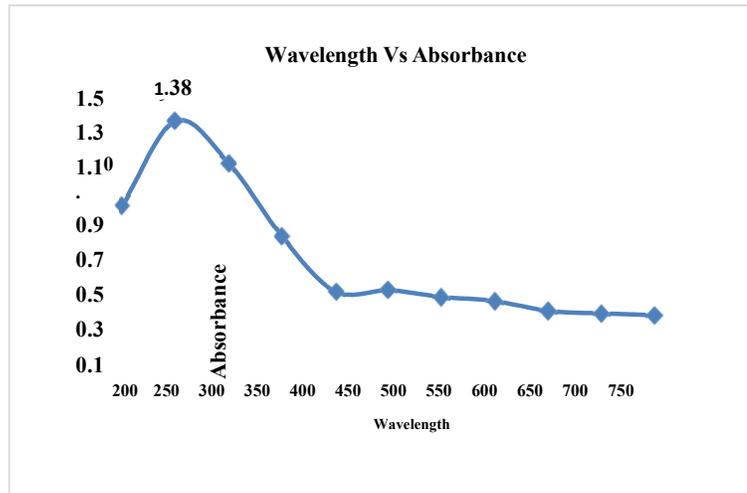
Figure 1: (200nm to 700nm)

Table 9: UV Spectra

Wavelength	Absorbance
210	0.313
220	1.29
230	0.972
240	1.287
250	1.344
260	1.031
270	1.003
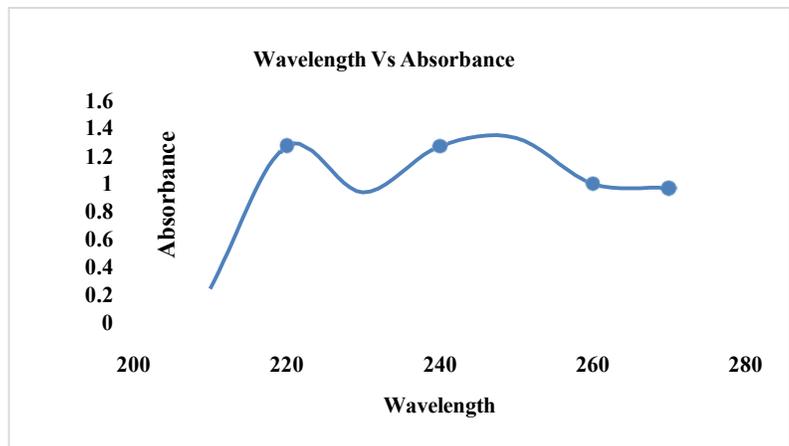
Figure 2: (210nm to 270nm)

Track 1	Standard
Track 2	Formulation
Track 3	Fenugreek
Track 4	Amla
Track 5	Hibiscus
Track 6	Neem
Track 7	Ashwagandha
Track 8	Brahmi
Track 9	Curry leaves

Figure 3: HPTLC Fingerprinting of Raw Material and Polyherbal hair oil Ultraviolet at 276nm

CONCLUSION

The formulation was prepared as per Ayurvedic Formulary of India, It was concluded that the polyherbal hair oil containing different ingredients. And its quality evaluation by organoleptic characteristics, microscopic evaluation, phytochemical testing, heavy metal detection, Acid value, saponification value, Peroxide value employing a standard methodology. [44]Also, the HPTLC Fingerprinting was done and the parameters studied were found to be sufficient to evaluate the formulation and can be used as a reference in developing pharmacopeial standards. Thus it was concluded that formulated Polyherbal Hair Oil having good hair nourishing property. [43]The study can be extended towards stability studies and can also be evaluated for its clinical development.[40]

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