

Formulation and Evaluation of Poly Herbal Hair Oil

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Abstract: The aim of present study involves preparation of polyherbal hair oil using plant materials. The prepared polyherbal hair oil evaluated different parameters within the acceptable limits. Such as phytochemical screening, organoleptic characterization, specific gravity, pH, viscosity, acid value, saponification value, refractive index, and also stability study. Antimicrobial assay of the polyherbal hair oil was studied by the zone inhibition method. And these helps reduces dandruffs and scalp of hairs. And to provide nutrition's of hairs. The antioxidant activity of the oil was studied by DPPH radical scavenging activity. The primary skin irritation test is carried out. Hence, these polyherbal hair oil increases hair growth, reduces hair loss, providing protection against dandruff. Now-a-days increasing demand of herbal formulation than synthetic formulation. They have better safety and also fewer side effects. Polyherbal hair oil using various fresh leaves of Hibiscus Rosa Sinesis, Aloe Barbadensis leaf, curry leaves, amla, shikakai. These formulations coconut oil as the base. Hair care products used both hair tonic as well as hair grooming aids

Keywords: polyherbal hair oil, antioxidant activity, antidandruff assay, herbs

I. INTRODUCTION

Hair is one of the vital parts of our body and it influences the overall appearance of person. Hair is a protein filament that grows from follicles found in the dermis. Hair is one of the most important of our body that improves the overall appearance of person. The hair fall, dandruffs, split ends, gray hair are the major problem associated with hair. Hair loss is distressing condition for an increasing number of men and women. Hair loss is or alopecia, is a common patient problems/complaint. And a source of significant psychological and physical distress. To overcome this problems, we use lots of hair care products use.

Hair oils are widely used in India for hair care. Indigenously available herbal ingredients are used to make hair oil. However nowadays, synthetic products are also used as perfume and coloring of hair oils. Traditionally hair oils are made from vegetable oils such as sesame seed oil, castor oil, coconut oil etc. But now petroleum white oils are used in the formulation of hair oil to reduce cost and improve product quality. Hair is present on most skin surfaces except the palms, palmar surface of the fingers, soles and plantar surfaces of the feet. In adults hair usually seen in the scalp, in the eyebrows, in the axillae (armpits) and around the external genitalia. Genetic and hormonal influences largely determine hair thickness and the pattern of distribution. Each hair follicle goes through a growth cycle, which consists of a growth stage and a resting stage.

The poly herbal hair oil was prepared by collecting various plant materials such as amla, aloe vera, bhringraj, camphor, Indian indigo, coconut oil, fenugreek, hibiscus, neem & rosemary oil. Accurately weigh all the dried and fresh herbs and are crushed into a fine form. Hair oils are widely used in India for hair care indigenously available herbal ingredients are used to make hair oil. However nowadays, synthetic products are also used as perfume and coloring of hair oils. Traditionally hair oils are made from vegetable oils such as sesame seed oil, castor oil, coconut oil etc. But now petroleum white oils are used in the formulation of hair oil to reduce cost and improve product quality. Hair is present on most skin surfaces except the palms, palmar surface of the fingers, soles and plantar surfaces of the feet. In adults hair usually seen in the scalp, in the eyebrows, in the axillae (armpits) and around the external genitalia

Genetic and hormonal influences largely determine hair thickness and the pattern of distribution. Each hair follicle goes through a growth cycle, which consists of a growth



stage and a resting stage. In traditional Indian system of medicine many plants and herbal formulations are reported for hair growth promotion as well as improvement of quality of hair. Herbal care products are defined as those formulation which are used for cleansing, modifying the texture of hair, changing of colour, giving life to stressed hair and providing nourishment of the hair.

Hair oils are the hair care formulations applied for treatment of hair disorders such as baldness, aggression of hair discoloring of hair, hair falling, and dryness of hair. Herbal hair oils are formulated with herbal extracts in oil base in our study, we have formulated herbal hair oils from Hibiscus Rosasinesis, Murraya koenigii, Aloe barbadensis, Phyllanthus embilica, Acacia concinna, Coconut oil used for the best medicine of hair growth.

Hibiscus Rosasinesis



Fig.no.1 Hibiscus Rosasinesis

Biological source-dried leaves of hibiscus Rosa sinesis.

Family- Malvaceae.

Uses – Nourishes and thickens hair. emollient, brain tonic, growth of hair, blackening of hair, Luster of hair, laxative, skin diseases, menorrhagia, treatment of bronchial catarrh, antiscorbutic, depurative.

Plant part used- Leaf

Curry Leaves



Fig.no.2 Curry Leaves

Curry Leaves Biological Source

The species name commemorates the botanist Johann Koing.

The genus Murray commemorates Swedish physician and botanist Johann Andreas Murray who died in 1791. Hence the botanical name of the curry leaves is Murraya koenigii.

Family- Rutaceae

Uses- Use prevents hair fall and premature graying of hair.

Plant part used- Leaf



Aloe Vera



Fig.no.3 Aloe vera Biological

Source- Dried leaves of aloe barbadensis miller Family- Liliaceae

Uses - Conditioner and moisturizing effect, remove dandruff, boost hair growth, nourishing the hair. Combination of aloe pulp and coconut oil are rich vitamins and minerals. These oil used as hair and scalp gives healthy, strong antidandruff free hair (antidandruff activity of the hair.)

Plant part used- whole plant.

Amla



Fig.no.4 Amla

Biological Source- Dried fruits of phyllanthusembilica.

Family - Phyllanthaceae.

Uses- Hair conditioner, treats scalp ailments, promotes hair growth. Amla is rich source of vitamin c, tannins, and minerals such as phosphorus, iron, calcium which provide nutrition to hair and also causes thick and dark hair.

Plant part used- Fruit

Shikakai



Fig.5 Shikakai

Biological source- It consist of the fruits of the plant acacia concinna. Linn.

Family- Leguminosae

Uses- It is used as natural hair wash for sensitive scalps or to control dandruff. It promotes hair growth strengthen hair roots and lengthy beautiful hair. These are used for herbal hair oil.

Plant part used- Fruit



Coconut Oil



Fig.no.6 Coconut oil

Biological source- Oil is derived from dried fruits of *Cocos nucifera*.

Family- Arecaceae

Uses- Nourishes of hair, moisturizing effect vehicle, stimulates hair growth by unclogging pores.

Plant part used- Fruit

Herbal cosmetics have growing demand in the world market and are in an invaluable gift of nature. There are a wide range of herbal cosmetics products to satisfy beauty regime. Adding herb in the cosmetics is very safe for our skin. Herbal hair oil is not only moisturizes scalp but also reverse dry scalp and hair condition. It provides numerous essential nutrients required to maintain normal functions of sebaceous gland and promote natural hair growth. Keeping this point in consideration the present work was undertaken.

.Hair oil has more preferred as they promote hair growth, Improve elegance of hair & prevent Hair fall.



HISTORY:

Hair oiling has its origin in Ayurveda, one of the prominent schools of medicine that offers holistic solutions. It originated more than 5,000 years ago and continues to benefit the mind, body, and soul. When you massage oil into your hair, you do not just strengthen your tresses, but also indulge in self-care. Herbal hair oil is one of the most well recognized hair treatments. Herbal hair oil not only moisturizes scalp but also reverses dry scalp and dry hair condition. It provides numerous essential nutrients required to maintain normal function of sebaceous glands and promotes natural hair growth.

Applying hair oil on a regular basis can enhance lubrication of the shaft and help prevent hair breakage. As well as preventing split ends, the right hair oil also gives hair radiant shine, detangles, and can enhance your hair colour. Hair growth – As the oil has enhanced penetration and reaches up to the hair follicle, it increases the circulation of the scalp, thereby increasing hair growth and reduce graying of hair. The Indian hair oil market is valued at USD 1,536.6 million in the current year. It is expected to witness a CAGR of 5.80% over the next five years. India has been a prominent market for hair oil over generations due to the practice of oiling the head regularly.

LITERATURE REVIEW :

Mrs. Aswathy.c, Farshana Parvine Preparation and Evaluation of Polyherbal Hair Oil: An Effective Cosmetic (2022), Polyherbal hair oil using various plant materials Such as Amla, Hibiscus, Neem, Indigo, Bringhraj, Camphor, Fenugreek, Coconut oil, Aloe vera, and Rosemary Oil. Herbal cosmetics are now-a-days widely used by the common people because of concept of fewer side effects and with a better safety and security profile. The prepared polyherbal hair oil evaluated different parameters such as Specific gravity, PH, Organoleptic properties, Sensitivity test, Saponification value, Acid value, Viscosity, and Phytochemical screening. The primary skin irritation test is carried out. Hence, polyherbal hair oil considered to increase the hair growth, reduces hair loss, and providing protection against dandruff.

The concept of beauty and cosmetics is as ancient as mankind and civilization. So, they use various beauty products that have herbs to look charming and young. Herbal cosmetics are now-a-days widely used by the common people because of concept of fewer side effects and with a better safety and security profile. The present work was aimed to formulate herbal oil for general purpose (application in hairs) using various herbs. The formulated hair oil contain different herbal plants which are traditionally utilized for hair growth plants used are Triphala, Nirgudi, Licorice, Jatamansi, Aloe vera, Shatavari, til oil and coconut oil. The formulated herbal oil was evaluated and various parameters such as viscosity, saponification value, pH etc.

The current research aimed to formulate polyherbal hair oil utilizing fresh and dried herbs like amla, aloe vera, Tulasi, hibiscus, shikakai, curry leaves, jasmine, neem, fenugreek and other ingredients such as almond oil, coconut oil. The polyherbal hair oil formulated can satisfy all the required conditions to keep the hair moisturized, strengthen the hair and prevent dandruff caused by bacteria. The prepared polyherbal hair oil was evaluated for pH, specific gravity, viscosity, irritation, grittiness, acid value, and saponification value. All the parameters were found to be good and within the limits.

Loss of colour in hair is because of shifted reasons like hereditary impact, impact of ecological variables, utilization of alcoholic arrangements, and so forth. However, the long- lasting engineered hair colours are accessible in various variety goes and hold normal radiance, they have the main detriment of creating easily affected responses in certain people. In the current examination different blends of powdered leaves and hair care plants like Henna, Indigo, Bhringraj, Amla, Shikakai, Gulvel, Brahmi, Jatamansi and Shatavari were assessed for their shading and awareness responses. Henna and Indigo detailing was viewed as reasonable normal colorant.

The current examination, endeavours were made to make a powder home grown hair colour that gives rosy earthy coloured tone to hair, looking like normal Hair tone with better colouring impact and more prominent maintenance limit on correlation with showcased natural hair colour plan. Most of the showcased Herbal hair colour definitions contain para- phenylenediamine at 20-25% fixations which is the primary element of business engineered colours. Setting off unfavourably susceptible skin responses in many people is known. Ayurvedic powder hair colour absent any trace of any engineered specialist was ready in present examination Work and assessed for colouring productivity.



Herbal formulations always have activity and comparatively lesser or no side effects with synthetic. The growth activity in a concentration range for 1-10% separately. Based on these results mixture of crude drugs fruits of *Embelica officinalis*, flowers of *Hibiscus rosasinensis*, leaves of *Bacopamonnieri* and seeds of *Trigonella foenumgraecum* were prepared in the form of herbal hair oil by boiling cloth method and were tested for hair growth activity, refractive index, acid value, saponification value. It holds the promise of potent herbal alternative for synthetic hair oils. Excellent results of hair growth were seen in formulation prepared by boiling method of oils preparation technique.

METHODS AND MATERIAL :

Collection and authentication of plant materials

The Polyherbal hair oil was prepared by collecting and using various plant materials these are, hibiscus rosasinesis leaf, curry leaf, aloe Vera leaf, amla, shikekai, coconut oil, are collected local region near Karad. Collected plants were identified by the collected leaves were dried in the shade and then powder to coarse consistency and stored in an air tight container at room temperature.

Culture

Clinical isolates of candida albiacans was procured from Rajarambapu College of pharmacy, kasegaon, Maharashtra for the in-vitro studies.

Formulation of polyherbal hair oil

All herbs of crude drugs are collected and dried under shade. Drying under shade will retain active constituents. Hence, shade drying is preferred over artificial drying. The dried crude drugs were made into coarse powder using mixer. Later on, all these coarsely powdered drugs are passed through mesh number 80. this, obtained powders are blended together to get uniform mixture. Now coconut oil and aloe Vera pulp is added. These all dried powders of mixed well. Now contents were boiled 15min and were filtrated through muslin cloth. To filtrate, coconut oil was added to make up volume. Finally, prepared polyherbal hair oil. And these are it was placed in amber colored bottle.

Table 1. Formula for herbal oil

Sr. no.	Ingredients	F1 (2%)	F2 (4%)	F3 (8%)
1	Hibiscus Rosasinesis	6 gm.	12 gm.	16 gm.
2	Curry leaf	6 gm.	12 gm.	16 gm.
3	Aloe Vera leaf	6 gm.	12 gm.	16 gm.
4	Amla	6 gm.	12 gm.	16 gm.
5	Shikekai	6 gm.	12 gm.	16 gm.
6	Coconut oil	50 ml.	50 ml.	50ml.

EVALUATION OF POLYHERBAL HAIR OIL :

Phytochemical Screening of Polyherbal Hair Oil preparations

The Prepared herbal oils were subjected to various qualitative chemical analysis for identification of various plant constituents like alkaloids, glycosides, flavonoids, tannins, phenols, steroids and saponins by using different techniques.

Physical Evaluation

In the test, the herbal oil was observed for colour, odor, physical state, solubility, specific gravity, PH, viscosity, refractive index, acid value and saponification value. Were determined manually.



Primary Skin Irritation Test

The prepared formulations are assessed for primary skin irritation test on our primary irritation test on our hand, little amount of F1, F2, F3, were applied on test site. The test site was observed for erythema and edema for 5 to 6 hrs.

Antidandruff activity evaluation (anti-microbial activity) cup plate method

The polyherbal hair oil was carried out diffusing dependent antimicrobial activity by zone inhibition method. The plate was incubated at 37°C for 2 days. Zone of inhibition was measured.

Antioxidant activity

DPPH radical scavenging test

One ml of oil solutions (20, 30, 40, 50 and 60 µg/ml. in acetone) was added to one ml of DPPH solution (0.2Mm in acetone). After a 30min of reaction at room temperature, the absorbance of the measured at 517nm. The antioxidant activity of the oil is measured against ascorbic acid as standard.

Stability Studies

Prepared polyherbal hair oil is observed for stability conditions. The polyherbal hair oil is observed for 1, 2, 3, 4, 5 and 6 months intervals.

Saponification value:-

Accurately weighed 1 mL of oil into a 250 mL of conical flask and 10 mL of ethanol: ether mixture (2: 1) was added. To this flask 25 mL of 0.5 N alcoholic KOH was. Kept the flask for 30 min. and the flask was cooled. The cooled solution was titrated against 0.5 N HCl using phenolphthalein indicator. Similarly the blank titration was performed without taking oil (sample). Amount of KOH in mg. used was calculated.

pH:

The pH of herbal hair oil was determined using pH meter.

Viscosity:-

The viscosity was determined using Ostwald's viscometer.

Specific gravity:-

Take the specific gravity bottle, rinsed it with distilled water, dry it in oven for 15 minutes, cool, closed it with cap and weigh it (a). Now fill the same specific gravity bottle with the sample and closed it with cap and again weigh it (b). Determine the weight of sample per milliliter by subtracting the weight (b-a)

RESULTS AND DISCUSSION :

Phytochemical screening of polyherbal hair oil preparations.

Table 2. Phytochemical evaluation of polyherbal hair oil

Name of the Test	Results
Alkaloids	-ve
Flavonoids	+ve
Steroids and Terpenoids	+ve
Glycosides	+ve
Tannins	+ve
Saponins	-ve
Phenols	+ve



PHYSICAL EVALUATION

Table 3. Organoleptic characteristics of polyherbal hair oil

Parameters	F1	F2	F3
Colour	Greenish brown	Greenish brown	Greenish brown
Odour	Pleasant	Pleasant	pleasant
Physical state	Liquid with greasy in nature	Liquid with greasy in nature	Liquid with greasy in nature
Solubility	Non-polar solvents	Non-polar solvents	Non-polar solvents
Specific gravity	0.98	0.88	0.84
pH	9.452	14.366	16.85
Saponification value	18.659	27.368	24.785
Refractive index	1.5047	1.5837	1.7345
Skin irritation	No irritation	No irritation	No irritation

Antidandruff activity evaluation (anti-microbial activity) cup plate method Antidandruff activity was carried out by measuring the zone of inhibition of different concentrations of polyherbal hair oil. All polyherbal hair oil showed good more activity as standard. Whereas F3 showed more activity against fluconazole. Shown in table 4.

Table 4. Zone of inhibition of polyherbal hair oil

Microorganisms (candida albicans)	Zone of inhibition in cm.				
	F1	F2	F3	Standard (Fluconazole)	Control (Coconut oil)
TRIL1 (cm)	1.3	1.3	1.5	1 cm	0.9 cm
TRIL2 (cm)	1.2	1.2	1.4		
TRIL3 (cm)	1	1.3	1.5		
AVG (cm)	1.1	1.17	1.47		

ANTIOXIDANT ACTIVITY

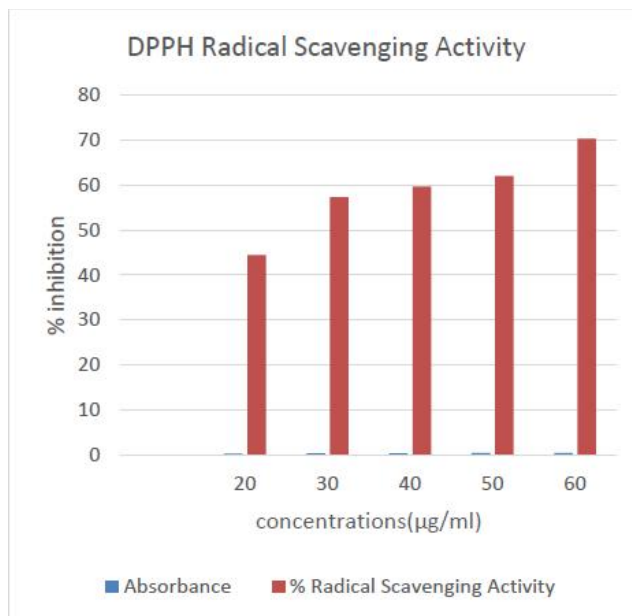
DPPH radical scavenging test

Antioxidant activity was carried out in DPPH radical scavenging assay. Polyherbal hair oil concentrations three showed more scavenging activity as compared to other concentrations. Antioxidant activity of polyherbal hair oil was studied by DPPH method, by taking ascorbic acid as standard. And results shown in table 5, 6, 7 and figure.7, 8, 9 respectively.

Table 5. Absorbance and % radical scavenging activity values of different concentrations of F1

Concentrations (μl/ml)	Absorbance	% Radical Scavenging Activity
20	0.235	35.26%
30	0.341	47.66%
40	0.362	58.49%
50	0.414	56.79%
60	0.448	66.57%
Standard (Ascorbic acid)	0.06	88.79%





Concentrations

Figure 7. Effect of polyherbal hair oil 1- on DPPH Scavenging Activity

Concentrations (µg/ml)	Absorbance	%Radical Scavenging Activity
20	0.272	38.87
30	0.368	54.45
40	0.384	56.88
50	0.422	58.90
60	0.468	69.22
Standard (Ascorbic Acid)	0.06	88.79%

Table 6. Absorbance and % radical scavenging activity values of different concentrations of F2



II. CONCLUSION

Polyherbal hair oil is one of the most well recognized hair treatments. Herbal formulations provides best mixture of vitamins, antioxidants, essential oils, and also provides nutrients of hair growth. These formulations maintaining good hair growth of hairs, stopping hair loss, reduces dandruff of hairs, also shining of hairs.

All the parameters showed that they are within the limits and since all the ingredients added have many advantages, this oil will help in maintaining good growth of hair, turning grey hair to black, strong and healthy hair, and fixed damaged hair, protecting from dandruff and results in lustrous looking hair. Hence from the present investigation, it was found that the formulated herbal hair oil has optimum standards and further standardization and biological screening establishes the efficacy of formulated herbal hair oil.

REFERENCES

1. Sunita verma. Hibiscus Rosa-sinesis multipurpose ornamental plant. International journal of research in pharmacology and pharmacotherapeutics.2016; 6(1):61-64.
2. Roji bista, arjun ghimire and sadikshya subedi. Phytochemicals and antioxidant activities of aloe Vera. Journal of nutritional sciences and healthy diet 2020; 1(1):25-36.
3. Kokate C.K, purohit A P and Gokhale S.B. In; Pharmacognosy, 19th Ed, nirali prakashan, pune, 2002.
4. Ramaya kuber, ch.lavanya, ch.nagaharitha, preeti, Rosa. Preparation and evaluation of polyherbal hair oil. Journal of drug delivery and therapeutics 2019; 9(1):68-73.
5. Usha kiran reddy, G.sindhu, Rajesh, Aruna, k.s.sandyarani. Preparation and evaluation of herbal hair oil.2017; 4(6):1540-1546.
6. Banerjee PS, Sharma M, Kumar RN. Preparation, evaluation and hair growth stimulating activity of herbal hair oil.J.Chem Pharm Res.2009; 1(1):261-267.
7. Ayyanar M, Lgnacimuthus, Medicinal plants used by tribal of tirunelveli hills, tamilnadu to great poisonous bites and skin diseases. Indian journal of traditional knowledge.2005; 4(3):229-236.
8. Shah C S, Qudry J S, A Text book of Pharmacognosy, 11th Edn., B.S. Shah Prakashan, Ahmedabad, 1996; 119.
9. Adhirajan, N., Dixit, V. K. and Chandrakasan, G., Development and Evaluation of Herbal Formulations for Hair growth, Indian Drugs, Nov-2001, 38 (11), 559-563.
10. Adirajan N., Ravikumar T., Shanmugasundaram N. and Babu M. In vivo and in vitro evaluation of hair growth potential of Hibiscus rosasinensis Linn. J Ethanpharm. 88: 235-239, 2003.
11. Suresh Kumar P, Sucheta S, Umamaheswari A, Sundarshana Deepa V, In Vitro and In vivo evaluation of anti-dandruff activity of formulated polyherbal hair oil. Journal of pharmacy research .2010; 3(12):2956-2958.
12. Habeeba Shaikh, Siddiqua Shaikh and Priya Rao. A Review on Indian traditional herb Murraya koenigii its nutritive and medicinal properties in human health management. 2020; 9(6):850-863. Amol joshi and Pravin dyawarkonda. Formulation and evaluation of polyherbal hair oil. International journal of green pharmacy.2017; 11(1):135-139.
13. Rathi V, Rathi JC, Tamizharasi S. What's more, Pathak A.K. Plants utilized for hair development advancement: A review. Phcog Fire up. 2008;2(3):165-167.
14. Dixit VK, Adhirajan N. what's more, Gowri C. Improvement and assessment of home grown definitions for hair growth. Indian Medications. 2001;38(11):559- 563.
15. Patni P, Varghese D, Balekar N. furthermore, Jain D.K. Detailing and assessment of home - grown hair oil for alopecia management. Planta Indica. 2006;2(3):27-30.
16. Adhirajan N, Ravikumar T, Shanmugasundaram furthermore N, Babu M. In vivo and in vitro assessment of hair growth capability of Hibiscus rosa sinensis Linn Ethan pharm. 2003;88:235-239.
17. Sanju N, Arun N, Roop KK. Restorative Innovation. Second Release. 2006, 379382.
18. Joshi AA, Dyawarkonda PM. Definition and assessment of polyherbal hair oil. Global Diary of Green Drug store. 2017;11(1):S135.
19. Bhatia SC. Fragrances, cleansers, and beauty care products, 2001, 639:641.



20. Banerjee PS, Sharma M, Nema RK. Readiness, assessment and hair development animating action of natural hair oil. Diary of Compound and Drug Exploration. 2009;1(1):261-267.
21. Mithal BM, Shah RN. A Hand Book of Beautifying agents. First Release, 2000, 141-142.
22. Singh RM. Indian Pharmacopeia. Legislature of India, Service of wellbeing and Family Government assistance, Distributed by, the regulator of Distribution, 1996.

