Formulation and evaluation of herbal hair oil

Sanjana Dashrath Dhanave, Akshay N.Raut, Dr .Santosh Jain
Aditya Institute of pharmaceuticals, Telgoan naka Beed, Maharashtra, India, pin – 431122
Dr Babasaheb Ambedkar Technological Univarsity Lonare, Maharashtra

Abstract: **Hair plays a very important role in the personality of humans and for their cure by using lots of cosmetic products. Herbs & herbal drugs are clinically proved good for hair growth. The herbal hair oil provides natural goodness to hair. Herbal hair oil contains vitamins & micro nutrients which acts as nutrition for your hair. Herbal hair oil which made from natural resources reinvigorate hair tissues. Herbal formulations always have activity and comparatively lesser or no side effects with synthetic. Hair loss is a relatively common occurrence that causes concern in people of all ages. Hair loss problem is of great concern to both males & females & the main problems associated with hair loss are hair fading, dandruff & falling of hair. Various synthetic medicines are available for hair loss which does not treat permanently & also shows severe side effects.**

In most cases, hair loss is permanent, but it can lead toalopecia. Hair root activation is necessary to improve hair development and prevent hair loss. Herbal hair oil not only moisturizes scalp but also converse dry scalp and dry hair conditions. It bestows numerous essential nutrients required to maintain normal functions of the sebaceous gland and promote natural hair growth.

Proper application of hair oil gives luster to hair, softening the hair, gives flowness to hair and more important gives cooling effect to brain. The most recognized hair care preparation is herbal hair oils, they moisturizes the scalp and also helpful in dry scalp and dry hairs. Herbal hair oil maintains normal functions of sebaceous gland as they supply normal essential elements for hair to naturally grow.

Keywords: **Herbal hair oil, Hair length, Hair loss, Hair formulation.**

AIM:
To Formulation & Evaluation of Herbal Hair Oil.

OBJECTIVES:
1)To promote the hair growth and smoothness of the hair.
2)To supplement the hair with vital nutrients such as vitamins.
3)To prevent the dandruff, spit ends, and dull hair.
4)To provide an alternative source from hazardous chemicals.

PLAN OF WORK :
Title: Preparation & Evaluation of Herbal Hair Oil.
Introduction of Herbal Hair Oil.
Drug profile of Herbal Hair Oil.
Evaluation of Herbal Hair Oil.

INTRODUCTION

Hair plays an important role in human life.[1] In India the traditional process is the preparation of hair oils put together with various hair growth promoting drugs. Indian women are known for their long, shiny and healthy hair, so it is not surprising that hair care features prominently in their self-care rituals. The Charaka Samhitha (the definitive book on Ayurvedic medicine) describes the importance of oiling the hair and scalp to maintain good hair health and prevent hair loss. The daily hair oiling was recommended with appropriate herbs filled to suit others constituents and this practice also continuous until today.[2]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.[3]
Proper application of hair oil gives luster to hair, softening the hair, gives flowness to hair and more important gives cooling effect to brain. Herbal hair oil maintains normal functions of sebaceous gland as they supply normal essential elements for hair to naturally growth.[4]. It smoothens the hair and gives a perfect shine. Oiling the hair increases the blood circulation in the scalp and hence repairing from the damaged hair.[5]Oiling hair Also regularly reduces

the hygral fatigue or the swelling and drying of the hair. Massaging of the with the oil helps in exfoliation and sometimes that helps in reducing hair fallalso.[6]

Hair oils are the hair care formulations applied for treatment of hair disorders such as baldness, aggression of hair discoloring of hair, hair falling, dryness of hair. Herbal hair oils are formulated with herbal extracts in oil base.[7]An oil massage also increases the hair growth by stimulating the hair follicles and improving blood circulation to the scalp.[8] Herbal formulation is completely made up of natural sources derived from the plants. There are different types of hair oils and all these are used for different purposes such as hair growth, health, dryness, scalp, fix damaging hair also used for dandruff, split ends and greying of hair etc.[9] After the preparation we have to performthe evaluation test. Evaluation provides a systematic method to study aprogram, practice, intervention or the initiative to understand how well it achieves its goal. It also helps to determine what works well and what could be improved in aprogramme.[10]

DRUG PROFILE OF HERBAL HAIR OIL:

For the preparation of herbal hair oil various plant materials were collected viz.,F enugreek seed, Hibiscus flower, AloeVera gel, Curry leaves, Neem leaves, Tulsi leaves Onion, Coconut oil, Vitamin-e.

FENUGREEK :

Synonym: Trigonella foenum-graecum, bird's foot, Greek hayseed, trigonella.

Fig.No.1 :Fenugreek

Biological source: Methi consists of dried ripe seed soft trigonella foenum graecum.

Geographical source:

The plant grows wild in northern India and is cultivated as a crop throughout India.

It is also cultivated in southern and Eastern Europe, Pakistan, France, Morocco and Egypt.

Toxonomic classification:

Kingdom	Plantae
Phylum	Tracheophytes
Subphylum	Angiosperms
Class	Eudicots
Subclass	Rosids
Order	Fabale
Family	Fabaceae
Genus	Trigonell
Species	T.foenum-graecum
Partsused	Seeds

In a 100 g amount, fenugreek seeds provide 1,350 kilojoules (323 kcal) of foodenergy and contain 9% water, 58% carbohydrates, 23% protein and 6% fat, with calcium at 40% of the Daily Value (DV, table). Fenugreek seeds (per 100 g) are a rich source of protein (46% DV), dietary fiber, B vitamins, and dietary minerals, particularly manganese (59% DV) and iron (262% DV).

Uses:

1.Fenugreek or methi seeds are frequently used as a natural home remedy for thinning hair and other related conditions, such as dandruff or a dry, itchy scalp.

2. Beauty publications and other popular media sources claim that they’re the secret to growing thick, shiny hair.

3.It is also a source of Nicotinic Acid, which encourages hair growth and Lecithin, which energizes hair follicles

HIBISCUS FLOWER:

Synonyms: Hibiscus arnottiiGriff. ex-Mast.; Hibiscus boryanus DC.; Hibiscus cooperiauct.; Hibiscus fest alis Srosiflorus alisb., Hibiscus liliiflorusGriff. ex Mast., Hibiscus rosiflorus Stokes and Hibiscusstorckii Seem.


Fig.No.2 :Hibiscus flowers

Biological source: Dried leaves of hibiscus Rosa sinesis.

Geographical source:
The probable origin of the plant was tropical Asia, It was cultivation in China, Japan and the Pacific islands for an equally long time, and it was generally thought that it was originated in South China.
The plant with deep-red flowers is believedto have an Asian origin, hence the name rosasinensis meaning 'rose of China. Now it is widely cultivated.

Kingdom	Plantae
Subkingdom	Tracheobionta
Division	Magnoliophyt
Super division	Spermatophyta
Class	Magnoliopsida
Subclass	Dilleniidae
Order	Malvales
Family	Malvaceae
Genus	Hibiscus
Species	Hibiscusrosasinensis
Parts used	Flower

Chemical constituents:
Approximately 15%-30% of the plant is made up of plant acids, including citric, malic, tartaric acids and allo-hydroxycitric acid lactone—i.e. hibiscus acid, which is specific to this plant.
Other chemical constituents are many, including alkaloids, L-ascorbic acid, anthocyanin, Beta-carotene, Beta-sitosterol, citric acid, polysaccharides arabins and arabinogalactans, quercetin, gossypetin and small amounts of galactose, arabinose, glucose, xylose, mannose and rhamnose.

Uses:
1. Stops hair loss.
2. Makes your hair look healthy and lustrous.
3. Prevents premature graying.
4. Thickens hair and add volume.
5. Used to treat dandruff.
6. Conditions against frizz, dryness, and breakage.
7. Prevents split ends.

ALOE-VERA:
Synonym: Alovevera, genus alove, succulent, cape aloe, burn plant, Aloe ferox.


Fig.No.3 :Aloe vera

Biological Source :
Aloe is the dried juice collected by incision, from the bases of the leaves ofvarious species of Aloe.
Aloe perryi Baker, Aloe vera Linn or Aloe barbadensis Mil and Aloe ferox Miller. Belonging to family Liliaceae.

Geographical Source :
Aloes are indigenous to East and South Africa, but have been introduced into the West Indies and into tropical countries, and will even flourish in the countries bordering on the Mediterranean.

Kingdom	Plantae
Order	Asparagales
Division	Spermatophyte
Subdivision	Angiospermae
class	Monocotyledoneae
Family	Liliaceae
Genus	Aloe
species	Cape aloe

Chemical constituents:
1. The chief chemical constituent of aloe is aloe-

emodin, which occurs in free form.
2. It is present as a glycoside in the various species of aloe.
3. The amount of emodin present in curacao aloe is two and half times less than the amount present in cape-aloes.
4. They also composed of anthrones and anthranols, which may be present infree or combined form as glycoside.
5. It also contain isobarbaloin and resins.
6. The active resin present in aloes is also known as aloesin.
7. Other chemical constituents are volatile oil to some extent which isresponsible of its characteristic odour.
8. -coniceine (piperidine) is also present in some species of aloe.
9. It also contain amino acids, enzymes, vitamins and minerals.
10. Sugars and hormones and salicylic acid is also present in aloe.
11. Steroids are also present in aloe.

Uses:-
1. Seborrheic dermatitis is the clinical term for thecondition we call dandruff. The symptoms of an itchy scalp and flaking skin under your hair can be treated with aloe vera.
2. Using aloe vera is a great way to get hair that looks healthier, shinier, andsofter.
3. Deep clean oily hair.Aloevera cleanses the hair shaft efficiently, stripping off extra sebum trusted Source (oil)
4. Strengthens and repairs hair strands. Aloevera contains vitamins A, C, and E. All three of these vitamins contribute to cell turnover, promoting healthy cellgrowth and shiny hair.

CURRY LEAF (Murrayakoenigii):
Synonym:
Synonym in Indian Language :
Curry Leaf (English), Karepaku (Andhra Pradesh), Narasingha (Assam);Barsanga, Kartaphulli (Bengal); Gorenimb (Gujrat); MithaNeem (Himachal Pradesh); Kathnim, MithaNeem, KurryPatta (Hindi); Karibeva (Karnataka); Kariveppilei (Kerala); Gandhela, Gandla, Gani (Kumaon); Bhursanga (Orissa); Mahanimb (Sanskrit); Karivempu (Tamilnadu).

Synonym in other language :
Burmese: Pindosine; Danish: Karrry bald; Dutch: Kerriebladeren; English:
Curry leaves; French: Feuilles de cury; German: Curryblatter; Indonesian:Daunkari; Italian: Fogli de Cari; Spanish: Hoja.

Fig.No.4:Curry Leaf

Biological source :
The species name commemorates the botanist Johann König.
The genusMurray commemorates Swedish physician and botanist Johann AndreasMurray who died in 1791. Hence the botanical name of the curry leaves is Murrayakoenigii.

Geographical source :
Murrayakoenigii originates from east and south part of India, Pakistan, SriLanka, China and Hainan but widely cultivated in South-East Asia and some parts of the United States and Australia.
It grows throughout India up to the height of 1500 to 1655m from sea level and in the Andaman Islands.
It is also available in other part of Asian region like in moist forests of 5001600m height in Guangdong, Shainan, S Yunnan (Xishuangbanna), Bhutan, Laos, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam.
Can grow in full sun or light shade.Murrayakoenigii is distributed from south and East Asia to Australia.

Chemical constituent :
Murrayakoenigii is very rich source of organic compounds with different chemical composition such as alkaloids, flavonoids carbohydrates, and sterol is present in the plant extract prepared in

solvents such as petroleum ether, ethyl acetate, chloroform, ethanol and water.

Leaves The fresh leaves of Murrayakoenigii contain 61.77-66.2% of moisture, 2.1-12.5%of protein, 14.6-18.97% of total sugar, 9.7-13.06% of total ash, 1.35-1.82% of acid insoluble ash, 1.35-1.82% of alcohol soluble extractive and water extractive value ranges between 27.33-33.45%.

Botanical name	Azadirachta indica
Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Sapindale
Family	Meliaceae
Genus	Azardichta A Juss.
Species	Azardirachta Indica A Juss
Parts used	Leave

Uses :

1)Curry leaves used as hair mask gives you bouncy and shiny hair.

2)The curry leaves contain antioxidant properties and iron that help strengthens the hair roots and shafts

3)Help moisturize the scalp and remove the dead hair follicles.

4)Preventing hair loss and thinning of hair.

Taxonomic status:

Kingdom	plantae
Sub-kingdom	Tracheobionta
Superdivision	Spermatophyte
Division	Magnoliophyta
Class	Magnoliospida
Subclass	Rosidae
Order	Sapidales
Family	Rutaceae
Genus	Murraya J. Koenig ex L
Species	Murrayakoenigii Spreng
Parts used	Leaves

NEEM LEAVES :

Synonyms: Melia Azadirachta. Margosa. Azadirachta indica.

Fig.No.5 :Neem Leaves

Biological Sources:

Neem consists of the fresh or dried leaves and seed oil of Azadirachta indica J. Juss (Melia Indica or M. azadirachta Linn.).

It is belong to family *Meliaceae*

It is also known as margosa, indian Lilac and Azadirachta indica.

Geographical source*:*

India is native of Azadirachta.

It is also cultivated in Nepal Pakistan Bangladesh and Sri-Lanka.

Neem is a fast growing tree that can reach a height of 15-20 m, rarely to 35-40m. It is evergreen.

Taxonomic status:

Chemical constituent :

Main chemical components are nimbin,nimbinene, azadirachtin, azadirachtol, azadirachnol, desacetynimbinene, nimbandiol, nimbolide, quercetin, beta-sitosterol, n-hexacosanol, nimbiol and nimocin [12]

Use:

1)It reduce hair loss by improving blood circulation in the scalp and hair. the sulphur in the juice helps in the production of essential collagen that promotes hair growth.2) Leaves Antimicrobial, antiseptic, antidandruff

TULSI LEAVES /HOLY BASIL:

Synonyms: Gauri, bahumanjari, pavani, gramya, surasa, vishnuvallabha, pavani, apetarakshashi, bhutaghni, devdundubhi, sulabha,sacred basil, kali-tulsi, veranda.

Fig.No.6 :Tulsi Leaves / Holybasil

Biological source:
Tulsi consists of the fresh and dried leaves of Ocimum species like Ocimum sanctum L. and Ocimum basilicum L. etc.

Geographical Source:
It is a herbaceous, much branched annual plant found throughout India, it is considered as sacred by Hindus. The plant is commonly cultivated in garden andalso grown near temples. It is propagated by seeds. Tulsi, nowadays, is cultivated commercially for its volatile oil.

Taxonomic status :
Chemical Constituents :
Tulsi leaves contain bright, yellow coloured and pleasant volatile oil (0.1 to 0.9%). The oil content of the drug varies depending upon the type, the place of cultivation and season of its collection.
The oil is collected by steam distillation method from the leaves and flowering tops. It contains approximately 70% eugenol, carvacrol (3%), and eugenol-methyl-ether (20%). It also contains caryophyl-lin.
Seeds contain fixed oil with good drying properties. The plant is also reported to contain alkaloids, glycosides, saponin, tannins, an appreciable amount of vitamin C and traces of maleic, citric, and tartaric acid.

Uses :
1. The fresh leaves, its juice and volatile oil are used for various purposes
2. Tulsi helps in prevention of hair loss
3. Tulsi strengthens the hair shaft
4. Tulsi treats dandruff and dry scalp
5. Tulsi helps to reduce stress
6. Tulsi promotes hair growth
7. Tulsi reduces itchiness

ONION:
Synonyms: Green onion, spring onion, scallion, Bermuda onion, Spanish onion, veg, Vidaliaonion, shallot veggie, vegetable.

Fig.No.7: Onion

Biological source :
The onion (Allium cepa L., from Latin cepa "onion"), also known as the bulb onion or common onion, is a vegetable that is the most widely cultivated species of the genus Allium.
The shallot is a botanical variety of the onion. Until 2010, the shallot was classified as a separate species.

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Lamiales
Family	Lamiaceae
Genus	Ocimum
Species	Ocimum sanctum
Taxonomic Rank	Taxon

Geographical source :
Many archaeologists, botanists, and food historians believe onions originated in central Asia. Other research suggests onions were first grown in Iran and West Pakistan.

Taxonomic status :

Kingdom	Plantae
Phylum	Tracheophyte
Subphylum	Angiosperm

Class	Monocot
Order	Asparagale
Family	Smaryllidaceae
Subfamily	alliioideae
genus	Allium
species	A.cepa

Chemical constituents :
Onion has been found to contain quercetin, fructose, quercetin-3glucoside, isorhamnetin-4-glucoside, xylose, galactose, glucose, mannose, organosulfur compounds, allylsulfides, flavonoids, flavenols, S-alk(en)yl cysteine sulfoxides, cycloalliin, selenium, thiosulfinates, and sulfur and seleno compounds.

Uses:
1. High sulphur content in onions help reduce breakage and thinning of hair. Sulphur is essential for regeneration of hair follicles.
2. Onion pulp can nourish your hair follicles and replenish the nutrients you have lost from your scalp.
3. The antibacterial and antifungal properties help to prevent and treat scalp infections. A healthier scalp will reduce hair loss.
4. Natural and powerful antioxidants, onions battle premature graying of hair.
5. When used regularly, onion paste or juice will not only nourish the hair, it will also create a natural shine for the hair. Over the period of time, this shine can become a permanent feature for your tresses.
6. Onion juice or pulp, being pungent and able to fight infections also help with lice treatment, and will prevent infestation in future.

COCONUT OIL:
Synonyms : Coconut oil, coconut butter, copra oil.

Fig.No.8: Coconut Oil

Biological Source :
Coconut oil is the oil expressed from the dried solid part of endosperm ofcoconut, Cocosnucifera L.,belonging to family Palmae.

Geographical Source:
Coconut is widely distributed throughout the world. It is largely cultivated in African and southeast Asian countries.

Chemical Composition :
Coconut obtained from the hard, dried endocarp consists of a mixture of triglycerides of saturated fatty acids. The oil contains about 95% of saturated fatty acids with 8 and 10 carbon atoms. It shows the presence of caprylic acid, 2%; capric acid, 50–80%; lauric acid, 3%; and myristic acid about 1%.

Uses :
1. Coconut oil is used to improve hair and scalp health.
2. It helps to get rid of some types of fungal infections.
3. Helps to heal or prevent dandruff and other fungi on the scalp.

GARLIC :
Synonym: Garlic, Lahsun

Biological Source :The drug consists of bulb of Allium sativumLinn

Geographical Source: Garlic is cultivated in India, Russia, USA, Italy and Southern Europe.

FORMULATION OF HERBAL HAIR OIL :
1. Different ingredients used in the formulation of herbal oil are presented in Table no.10all ingredients taken in given amount.
2. precisely all the dried and fresh herbs such as

hibiscus flower, curry leaves, neem leaves, tulsi leaves,fenugreekseed, aloe-vera,onion, garlic and also coconut oil were weighed and taken.

3. Begin with soaking fenugreek seeds in water for 30 minutes.
4. Then cut the aloe vera into small pieces.
5. In the mortar, all the weighed materials were taken and triturate with the pestle and the mixture was mixed in 50 % of oil.
6. The above content was boiled for 20 minutes till the colour start to change to yellowish and then filtered through a clean cloth.
7. Let the oil cool down.
8. Finally, the it was placed into the dry plastic bottle or container and labelled.

Fig.No.10: Formulation of Herbal Hair Oil

INGREDIENT:

The various ingredients used in the formulation of herbal oil are presented in below

Evaluation parameter	Formula (F1)	Formula (F2)
Sensitivity test	Non sensitive	Non sensitive
Irritation test	Non irritant	Non irritant
pH	6.5	6.7
grittiness test	Smooth	Smooth
Colour	Brownish yellow	Brownish yellow
Odour	Aromatic	Aromatic
viscosity	0.91	0.93
Specific gravity	0.914 /25°C	0.912 /25℃
Acid value	4.5	4.3

EVALUATION OF HERBAL HAIR OIL:

This prepared hair oil have to be evaluated by some parameters for its quality check up.

There are different types of evaluation test for hair oils such as:

1. Organoleptic Property
2. Sensitivity test
3. PH
4. Viscosity
5. Specific gravity
6. Acid values

Organoleptic Property:-

Colour, physical state, and odour were manually determined for various organoleptic properties.

	Ingredients	F1	F2
1)	Fenugreek seed	5%	6%
2)	Hibiscus flower	15%	10%
3)	Aloe Vera	5%	10%
4)	Curry leaves	10%	8%
5)	Neem leaves	4%	5%
6)	Tulsi leaves	3%	5%
7)	Onion	6%	4%
8)	Coconut oil	50%	50%
9)	Garlic	2%	2%

Sensitivity test :

This test performed by 3 volunteers by applying on skin and kept it for 30 minutes under the sunlight.

Conclusion: No irritation was observed.

pH:-

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

Viscosity:-

The viscosity was determined by Ostwald's viscometer. The viscometer was mounted in a vertical position on a suitable stand. Oil was filled into the viscometer up to mark A. The was counted for water to flow from mark A to mark B.

Specific gravity:-

Specific gravity bottle was performed by washing with distilled water dried it and took weight of empty bottle. (Weight –A)

Now same specific gravity bottle was filled with oil sample and took weight of it. (Weight- B)

Calculation- subtracting (weight B – weight A)/ mm.

Acid value:

Preparation of 0.1 molar solution:

Weighed 0.56 g KOH pellets and dissolved in 100 mL of distilled water and stirred continuously. The prepared 0.1 molar KOH solution was filled in the burette.

Preparation of sample:
10 mL oil was measured and dissolved in 50 mL of 1:1 ethanol and ether mixture and shaked vigorously.

RESULT

The most common well-known hair remedies is herbal hair oil. Herbal hair oil not only moisturises the scalp but also helps to heal dry scalp and hair and give antidandruff activity .It contains a variety of essential nutrients that support normal sebaceous gland function and promote natural hair growth.
The following parameters were evaluated for the prepared herbal hair oil using the abovementioned ingredients, and the results are listed below:
Many pharmaceutical industries are now moving in preparation of such kind of pharmaceuticals products and in future it has scope for longer time. Use of naturally occurring product enhances the productivity and quality of product by provide required amount of nutrients and having null side effects. Every human being wanted long , shiny , strong hairs with no side effects and also in minimal price cost.

CONCLUSION

In day to day life humans faced some hair fall problems due to various reasons. It may be some mental stress or may be genetic or may be some hormonal imbalance. Herbal hair oil is one of the most well-known hair remedies. India is part of a growing range of medicinal herbs with a variety of preventive and curative properties. It has been established that the formulation is safe for human use. Which is essential for maintain good and healthy life style.
Herbal extracts have been shown to have anti-hairfall, anti-dandruff properties. and constituents used in the formulation of herbal hair oil, which is used together, they had a stimulating impact in promoting good, lustrous hair growth. Every human being wanted long, shiny, strong hairs with no side effects and also in minimal price cost. Last but not least that we conclude that, this kind of herbal oil has good nutritional quality

REFERENCE

[1] https://www.tsijournals.com,Int.J.Chem.Sci:10(1),2012,349-353.
[2] IJRAR, E ISSN 2348-1269, PRINT ISSN 2349-5138.
[3] Ramaya kuber, ch.lavanya, ch.nagaharitha, preeti, Rosa. Preparation and evaluation of polyherbal hair oil. Journal of drug delivery andtherapeutics2019; 9(1):68-73.
[4] Nema RK. Preparation, evaluation and hair growth stimulating activity of herbal hair oil. J Chem pharma Res. 2009;1(1):261–7.
[5] Pande SD, Joshi SB, Bobade NN, Wankhade VP, Tapar KK.Formulation andDevelopment of a Liposome Based Hair Revitalizer.R J Topical Cosmetic Sci. 2011;2(1):14–17. doi: 10.5958/ 2321-5844.
[6] Adhirajan N., Ravikumar T., Shanmugasundaram N. furthermore, Babu M. In vivo and in vitro assessment of hair growth capability of Hibiscus rosasinensis Linn Ethan pharm. 88: 235-239,2003.
[7] Fatima grace X, Rahul raj s, shanmughanathans, chanmundeeshwari.