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Formulation and Evaluation of Polyherbal Hair Oil for Treatment of Alopecia



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ABSTRACT

Herbal medicines and herbal formulations are an integral part of the health care system. Herbal care products are great on high demand since primitive times thus they have an effective action of stimulation with a minimum number of side effects. The aim of present work involves preparation of polyherbal hair oil from onion seed, olive, mustard, argan, castor, neem, almond, flax, kalonji, jatamansi, hibiscus flower, lemon grass, bermuda grass, bhringraj, aloe vera, brahmi, amla, shikakai henna and camphor. Thus, evaluated with different parameters such as organoleptic, polarity, solubility, specific gravity, irritancy, sensitivity, viscosity, acid value, saponification value and pH and grittiness. It is effective in treatment of hair problems like alopecia or baldness, dandruff, flaky scalp, hair fall and head lice. They show mechanism of action by Activation of hair papilla through cleaning the hair pores and reinforcement of the capillary vessels by carrying nutrition to hair follicles and enhance the hair growth, soften hair, moisturizes improves circulation of blood in the scalp, turning grey hairs to black, raise hair volume, protecting hair from dandruff and results in lustrous hair growth. Hence, the study concluded polyherbal hair oil is excellent for the treatment of alopecia and other hair growth problems.



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INTRODUCTION

Herbal cosmetics are prepared by the combination of bioactive ingredients and pharmaceutical products. The presence of phytochemicals and botanicals in the herbal products have dual significance, one that they are used as cosmetics for body care and another that phytochemicals improve the biological functions of human body naturally results in healthy skin and hairs.[1] It is an ancient methodology because its origin was discovered from the holy Vedas and in Unani scriptures. As the realization said that chemical medicines are not effective as magic bullets and they may have side effects. The current trend moves toward the herbalism and the use of natural products. Indian herbs are the richest source to be used in cosmetic industries.[2]. Herbs are added in cosmetics as they are safer for our skin.[3] Herbal hair oils were serving the purpose of hair treatment. Herbal hair oil not only moisturizes scalp but also reverses dry scalp and dry hair conditions to increase hair growth. It provides numerous essential nutrients required to maintain normal functions of the sebaceous gland and promote natural hair growth. Polyherbal hair oil includes herbal drugs called hair tonics. These are formulated by herbal extracts in an oil base. Hair oils are the hair care formulations applied for hair disorders such as alopecia or baldness, greying of hairs, hair falling, and dryness of hairs.

ALOPECIA

Alopecia known as baldness as refers to a loss of hair loss from part of the head or body. The severity of hair loss can vary from a small area to the entire body. Inflammation or scarring is not usually present. Hair loss in some people causes psychological distress and other disorders and diseased state.

COMMON TYPES OF ALOPECIA

Male-pattern hair loss, female-pattern hair loss, alopecia areata, and a thinning of hair known as telogen effluvium. The cause of male-pattern hair loss is a combination of genetics and male hormones, the cause of female pattern hair loss is unclear, the cause of alopecia areata is autoimmune and the cause of telogen effluvium is typically a physically or psychologically stressful or disordered event. Telogen effluvium is common in pregnancy due to high alterations in the body.

CAUSES OF ALOPECIA

Hair loss can occur with scarring or inflammation include fungal or other microbial infections, lupus erythematosus, radiation therapy, and sarcoidosis may lead to severe hair loss or hair damage. The condition occurred due to the attack of white blood cells on hair follicles causing them to shrink, dry and slow down hair production growth. It causes the body's immune system to target hair follicles for the parameters of hair growth. Genetics are involved as in alopecia areata it occurs mostly in a person who has a close family member or generation with the disease. Atopy is a disorder characterized by a tendency to be hyperallergic, thyroiditis, and vitiligo can also be lead to inhibition of hair growth factor.

SYMPTOMS OF ALOPECIA

The symptoms of alopecia or baldness include hair loss in patches usually in circular patterns, dandruff, skin lesions, itchiness, and scarring on the scalp. Alopecia areata may be mild to a medium level usually it is observed in the form of unusual hair loss areas the backside of the head or above the ears, areas the male pattern baldness usually does not affect. In male-pattern hair loss, loss and thinning begin at the temples and the crown region and hair either thins out or falls out. Female-pattern hair loss occurs at the frontal and parietal region.

PATHOPHYSIOLOGY OF ALOPECIA

Hair follicle growth occurs in cycles. Each cycle consists of a long growing phase called anagen, a short transitional phase called catagen, a short resting phase called telogen. At the end of the resting phase the hair falls out said to be exogen and a new hair starts growing in the follicle beginning the cycle again. About the age of 40, 0–78 in men hairs reach the end of their resting phase each day and fallen out. When more than 100 hairs fall per day a clinical hair loss disruption of the growing phase causes abnormal loss of anagen hairs anagen effluvium which leads to hair growth inhibition.

MECHANISM OF ACTION OF POLYHERBAL HAIR OIL

1. **Through cleaning the hair pores:** a particular thin hair is usually slim and there is a large clearance between the hair pore and hair shaft. Therefore, the pores tend to get blocked by dandruff or waste matter. It is necessary to clean the pores and the scalp for liquid ingredients to penetrate deeply into the hair root. Polyherbal herbal hair oil stimulates the area around the hair matrix and hair root. Improve and the activity of the reticulo-endothelial function and activate the action tissue cells.
2. **Through the activation of hair papilla:** a disordered hair matrix cannot produce new hair thus it is unable to absorb amino-acid, to make polypeptide to turn into Keratin, even if the capillary vessel carries nutrition to the hair root. Through polyherbal hair oil growth Accelerators contain various effective ingredients to accelerate the reproduction of healthy new hair.
3. **Through reinforcement of the capillary vessels and carrying of nutrition to hair follicles:** Amino-acids mainly cysteine are essential for the healthy growth of hair. Weak capillary vessels cannot furnish enough nutrition from foods and supply to hair papilla through polyherbal hair oil ingredients Hair growth Restorers can reduce the pressure on the blood vessels and also prevent the force of contraction of the vessels and expand the vessels and stimulate blood circulation.

COLLECTION OF PLANT MATERIAL

Polyherbal hair oil was prepared by collecting various plant materials like onion seed oil, mustard oil, neem, flaxseed, hibiscus, olive oil and other ingredients were procured from a local market.

1. **Onion seed oil:** Biological source: it is obtained by seeds of *Allium cepa*. Family: Amaryllidaceae. Uses: it helps to bring silkiness and strength to tresses and improves hair growth and smoothness.
2. **Olive oil:** Biological source: it is obtained by expression of the ripe fruits of *Olea europaea* Linn. or Indian olive (*O. ferruginea*). Family: Oleaceae. Uses: it moisturize hair and reduces scalp irritation and to massage hair.

3. **Mustard oil:** Biological source: it is obtained from the seeds of *Brassica nigra* or *Brassica juncea* or *Brassica alba*. Family: Brassicaceae Uses: as moisturizer, vehicle, stimulates hair growth by unclogging pores and blood circulation enhancer.
4. **Castor oil:** Biological Source: It is the vegetable oil obtained from the seeds *Ricinus communis*. Family: Euphorbiaceae. Uses: in manufacturing of soaps, lubricants, hydraulic and paints, dyes, coatings, inks and pharmaceuticals, perfumes.
5. **Argan oil:** Biological source: oil produced from the kernels of *Argania spinosa linn.* Family: Sapotaceae. Uses: The antioxidants in argan oil promote cell production. The vitamins in argan oil promote healthy skin and scalp with thick and healthy hair to root.
6. **Almond oil:** Biological source: oil obtained by expression from the seeds of *Prunus amygdalus* or *P. amygdalus var. amara*. Family: Rosaceae. Uses: it contains high amounts of vitamin E, which is a natural antioxidant for hair growth promoter.
7. **Neem:** Biological source: Neem consists of fresh or dried leaves and seed oil of *Azadirachta indica*. Family: Meliaceae. Uses: as antifungal and anti-inflammatory, the extract is used to curb dandruff. It helps the hair follicles to become stronger and also encourages hair growth.
8. **Flaxseed:** Biological source: seeds of *Linum usitatissimum*. Family: Linaceae. Uses: They nourish the follicles and hair shafts, making them stronger and less prone to damage.
9. **Kalonji:** Biological source: annual flowering plant seeds of *Nigella sativa*. Family: Ranunculaceae. Uses: as antioxidant nutrient strengthen hair, help treat hair loss, and prevent premature graying. It fights the *Malassezia* fungus that causes dandruff and works as a hair conditioner.
10. **Jatamansi:** Biological source: dried roots and rhizomes of *Nardostachys jatamansi*. Family: Caprifoliaceae. Uses: as stimulant, antispasmodic, and to treat hysteria, convulsions, epilepsy, insomnia, blood, circulatory and strengthen hair roots.
11. **Hibiscus:** Biological source: It is obtained from a dried flower of the plant *Hibiscus syriacus* or *Hibiscus rosa-sinensis*. Family: Malvaceae. Uses: as moisturizer and help to reduce the occurrence of dry flaky scalp.

12. **Lemongrass:** Biological source: dried leaves of *Cymbopogon*. Family: Poaceae. Uses: for strengthening hair follicles, adding shine, relieving scalp irritation and itchiness, and reducing dandruff.

13. **Bermuda grass:** Biological source: dried leaves of *Cynodon dactylon*. Family: Poaceae. Uses: for strengthening hair follicles.

14. **Bhringraj:** Biological source: whole dried plant of *Eclipta prostrate*. Family: Asteraceae. Uses: it helps to nourish hair and promotes hair growth. A regular application helps to prevent hair loss, fights dandruff, baldness and premature greying of hair.

15. **Aloe vera:** Biological source: a whole plant of *Aloe barbadensis miller*. Family: Asphodelaceae. Uses: in beverages, skin lotion, cosmetics, or ointments for minor burns and sunburns. There is little clinical evidence for the effectiveness or safety of Aloe vera extract as a cosmetic or medicine.

16. **Bramhi:** Biological source: It is the leaves or flowers of plant *Bacopa monnieri*. Family: Plantaginaceae. Uses: Promote healthy skin and hair, clarify mind, support healthy blood cells.

17. **Amla:** Biological source: Dried fruits of *Phyllanthus emblica*. Family: Phyllanthaceae. Uses: hair conditioner, treats scalp ailments, promotes hair growth.

18. **Shikakai:** Biological source: It is the podes of plant *Acacia concinna*. Family: Fabaceae. Uses: Traditionally used as shampoo, good cleanser, promote hair growth, give shine to hairs.

19. **Henna:** Biological source: dried leaves of *Lawsonia inermis*. Family: Lythraceae. Uses: to dye skin, hair, and fingernails, as well as fabrics including silk, wool, and leather.

20. **Camphor:** Biological source: it is obtained from *Cinnamomum camphora*. Family: Lauraceae. Uses: it makes hair soft and boosts hair growth. This will stimulate blood flow to the applied area and promote hair growth.

PROCEDURE AND FORMULATION OF HERBAL HAIR OIL

All herbs are dried and powdered. All the oils are mixed well with each other. The other dried herbs powdered and mixed with the oil phase. The above content boiled for half an hour and filtrated through a muslin cloth. Then cooled to a normal temperature at 25*c and stored in an appropriate container.

Table no. 1: Formulation of polyherbal hair oil

Sr. No.	Ingredients	Properties	Quantity
1.	Onion seed oil	Hair growth promoter	10ml
2.	Olive oil	Anti-dandruff, hair growth	5ml
3.	Mustard oil	Blood circulation, scalp growth	5ml
4.	Castor oil	Antiseptic	5ml
5.	Argan oil	Increase hair elasticity and shine hair	5ml
6.	Almond oil	Cure hair loss	5ml
7.	Neem oil	Antimicrobial	5ml
8.	Flaxseed	Nourish hair follicle	5gm
9.	Kalonji seed	Strengthens hair	5gm
10.	Jatamansi	Flavouring agent	5gm
11.	Hibiscus flower	Hair moisturizer	5gm
12.	Lemongrass	Anti dandruff	5gm
13.	Bermuda grass	Hair growth	5gm
14.	Bhringraj	Premature hair growth	5gm
15.	Aloe vera	Anti dandruff	5ml
16.	Brahmi	Nervine tonic	5gm
17.	Amla	Hair growth	5gm
18.	Shikakai	Hair cleanser	5gm
19.	Henna	Hair dye	5gm
20.	Camphor	Soften hair	5gm

EVALUATION PARAMETERS OF HERBAL HAIR OIL

1. **pH:** pH of the herbal oil was detected using pH meter.
2. **Viscosity:** Viscosity was determined using Ostwald's viscometer.
3. **Organoleptic property:** Colour, odor, skin irritation was determined manually. Oil was applied on hand and exposed to sunlight for 5mins to check for any irritation over skin.
4. **Sensitivity test:** The prepared herbal hair oil was applied on 1 cm skin of hand and exposed to sunlight for 4-5 min.
5. **Acid value:** preparation of 0.1 molar solution: weighed 0.56g KOH pellets and dissolve in 100 ml of distilled water and stirred continuously. The prepared 0.1 molar KOH solution was fill in the burette. 10ml of oil was added with 25ml of ethanol and 25ml of ether. Phenolphthalein was added as indicator and titrated with 0.1M potassium hydroxide solution, Acid value = $5.61n/w$. therefore $n = \text{Number of ml of 0.1M KOH}$ $w = \text{Weight of oil}$.
6. **Saponification value:** 2g of oil was accurately weighed and transferred into a 250ml iodine flask. 25ml of 0.5M alcoholic potassium hydroxide was added and boiled under reflux on a water bath for 30mins. Phenolphthalein was added as indicator and titrated against 0.5M HCl ('a' ml). A blank performed ('b' ml) without the sample. Saponification Value: $28.05(b-a)/w$ Where, $w = \text{weight in grams of the solution}$.
7. **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). Determined the weight of the sample per ml by subtracting the weight (b-a).

RESULTS AND DISCUSSION

The polyherbal hair oil is prepared by using the herbal ingredients and evaluated with several parameters for the treatment of alopecia. The polyherbal hair oil prepared from various herbs and oils naturally occurring agents (Table: 1) with their properties in the formulation. The various parameter like sensitivity test, viscosity, pH, Saponification value, acid value and other stability parameters of polyherbal hair oil evaluated (Table: 2). Hence from the present

investigation and biological screening establishes the efficacy and effectiveness of the formulated polyherbal hair oil.

Table No. 2: Evaluation parameters of polyherbal hair oil

S. no.	Parameters	Observation
1.	Colour	Brownish
2.	Odor	Pleasant
3.	Polarity	Non-polar
4.	Solubility	Soluble in non-polar solvents
5.	Specific gravity	1.098
6.	pH	5.7
7.	Viscosity	0.96
8.	Acid value	4.8
9.	Saponification value	115.08
10.	Irritancy test	No irritation
11.	Sensitivity test	No irritation
12.	Grittiness	Smooth

HUMAN

CONCLUSION





Polyherbal hair oil formulation provides an excellent blend of vitamins, antioxidants, terpenoids, and essential oils. All the values in the evaluation of the finished product showed that they are within acceptable limits. Hence, it is concluded that the oil is beneficial and effective in the treatment of alopecia or baldness and enhance the hair growth, soften hair, moisturizes improves circulation of blood in the scalp, turning grey hairs to black, raise hair volume, healing from dandruff, provides lustrous hair growth.

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