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FORMULATION AND EVALUATION OF ROSEMARY HAIR OIL

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ABSTRACT

One of the most often used natural items is essential oil, which has several uses in dermatology. A illness known as hair loss causes hair to fall out of places on the skin where it normally grows, such as the body and scalp. The natural, nontoxic, nonpollutive, and biodegradable essential oils have many medicinal uses and little chance of negative side effects. Rosemary oil has received considerable attention in hair because it is said to promote hair growth and prevent hair loss. Rosemary oil is an essential oil obtained from the rosemary plant native to the Mediterranean region. It has been used for centuries and is known for its aromatic fragrance. Rosemary oil has several beneficial properties and has been used in the folk medicine, pharmaceutical, and cosmetics industries, mainly for its antioxidant and anti-inflammatory properties, which are attributed to the presence of carnosol/carnosic and ursolic acids. The therapeutic use of rosemary has been explored for the treatment of inflammatory diseases; however, other uses have been studied, such as wound healing and skin cancer and mycoses treatments, among others. Besides it therapeutic uses, rosemary has potential applications in cosmetic formulations and in the treatment of pathological and non-pathological conditions, such as cellulite, alopecia, ultraviolet damage, and aging. This review aims to critically discuss the topical applications of rosemary found in the literature while also offering relevant information for the development of topical formulations of its bioactive compounds. Topical application is an important administration route for drugs requiring local action on the skin, thereby avoiding their systemic absorption and adverse side effects. Numerous research have proven that topically carried out rosemary oil can certainly stimulate hair regrowth and assist basic hair health. In fact, one examine even as compared its effectiveness to that of minoxidil, a usually used medicinal drug for hair loss[25].The hair growth activity, refractive index, acid value, and saponification value of hair formulations of Rosmarinius officinalis , Trigonella foenumgraecum , and Hibiscus rosasinensis , Ricinus communis , phyllanthus emblica ,Eclipta prostrata in various concentrations as herbal oil were investigated. Hair growth was observed in formulations made using a variety of oil preparation techniques and the results were admirable.[26]

KEYWORDS: Rosemary, polyherbal , hair oil , Formulation , Evaluation, hair loss , hair growth .

INTRODUCTION

Hair is one of the body's most important organ made from skins ecoderm; it protects the body along with sebaceous glands, is considered an accessory structure of the integument . Alopecia is a medical term which means loss of hairs. It can affect just your scalp or your entire body.[5] Alopecia is temporary or permanent; it can be more in men. Most typical type of hair loss is described as "Androgenetic alopecia " which means that both hormones (androgen & male hormone) and heredity (genetics) are required for the disorder to manifest

.Rosmarinus officinalis L. commonly known as rosemary, belongs to the Lamiaceae family.[7] The genus Rosmarinus was combined with the genus Salvia in a recent phylogenetic analysis. This means that Rosmarinus officinalis is no longer the correct name of the species under study. Since the name Salvia officinalis was already used at the time of the merger, that species needed a new special epithet for Salvia, which is why it is now known as Salvia Rosmarinus.[8]An evergreen perennial shrub belonging to the Lamiaceae family Rosemary, originally from the Mediterranean region, is cultivated today around the world because it is used as a natural preservative and spices . Rosemary was also used as a source of traditional medicine for centuries.The best studied components of rosemary are caffeic acid and its derivatives, rosmarinic acid. These compounds are thought to have antioxidant properties and have are being investigated as potential therapies for cancer, hepatotoxicity and inflammation to the conditions. There are currently no high-quality human trials on rosemary and its potential therapeutic applications. A small number of methodological studies show promise in improving mental state (through aromatherapy) and a against hair loss.[10]

HAIR

Hairs are protein filaments that grow from follicles in the skin. The hair of mammals is one of their most distinctive features. Hair is most commonly associated with hair development, hair types and hair care, but it is also an important biomaterial composed mainly of proteins, especially alpha-keratin[15]

Structure of hair :

Hair roots and hair shafts are present in every hair. The portion of the hair that protrudes from the skin and is visible is known as the shaft. The skin's deeper layers are where the hair root is located and extends. The sebaceous gland is related to the hair follicle ,which is encircled by a sheath of skin and connective tissue. A tiny muscle known as the arrector pili is connected to each hair follicle and has the ability to cause the hair to stand up. At the hair follicle, several nerves also terminate. These nerves can detect the slightest draught and pick up on hair movement.The hair root enlarges into a rounded hair bulb at the hair's base. The papilla that produces hair is the hair papilla[30].

Composition:

Keratin, a fibrous and helical protein (in the shape of a helix) that is a component of the composition of the skin and all phanera (hair, nails, etc.), makes up 95% of the protein in hair.Keratin, which is produced by keratinocytes, is insoluble in water, providing waterproofing and protection for hair. Proline, threonine, leucine, and arginine are just a few of the 18 amino acids that make up hair. Keratin, a type of sulphur amino acid, is particularly abundant in cysteine, forming disulfide bridges between molecules to give the material's rigidity and strength as a whole.[32]

There are 3 different components to the hair structure:

- **The pith (or medula):** the pith is the centre portion of the shaft and is made of an amorphous, soft, and oily substance.[4]

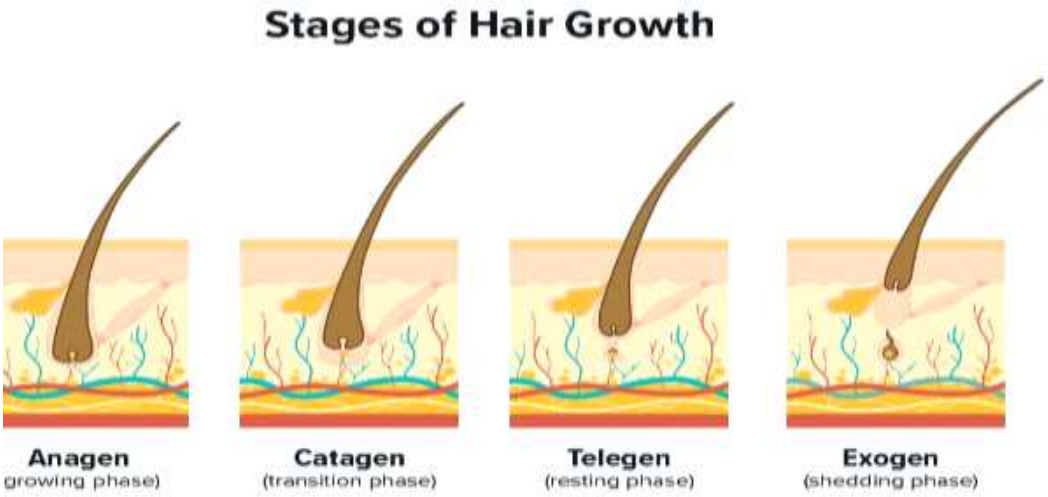
- **The cuticle:** a thin, protective outer layer that contains the nutrients required for the growth of the hair. It is highly keratinized and is made up of cells that resemble scales and overlap one another; these cells are roughly 60 micrometres long and 6 micrometres wide.

- **The cortex:** the fundamental structural element of the hair, where we find the long keratin chains that give the hair its elasticity, flexibility, and resistance. Intercellular cement, which is lipid- and protein-rich, holds the cortex's cells together. In accordance with the direction of hair length, bundles make up each cell.[22]

HAIR GROWTH CYCLE

Hair grows from the follicle or root underneath the skin. The hair is 'fed' by blood vessels at the base of the follicle,which give it the nourishment it needs to grow. Between starting to growand falling out years later, each hair passes throw four stages, that is Anagen, catagen, telogen and exogen another stage kenogen has been recently released. Every hair is at a different stage of the growth cycle.[28]

Anagen (growth),catagen (transition),and telogen (rest) are the three phases of each hair growth. Anagen phase might be brief as 2 to 6 years. The growth activity increases in catagen phase. Phase last two to three weeks there is a telogen phase, when the hairs enter their resting phase as in 2-3 months.



1.Anagen phase:

The first stage is called anagen stage and lasts approximately 1,000 days. The anagen phase is known as growth phase.

It begins in the papilla and can last from two to six years. 80 to 90 percent of human hair is in the anagen stage. This is the period of active growth when the cells around the follicle are rapidly dividing and depositing material within the hair. During this phase the cells in the papilla divide to produce new hair fibres and the follicle.[30]

2.Catagen phase :

At the end of the anagen phase hairs enters the catagen phase.
It is the short transitional phase that lasts approximately 10 days.
The first sign of catagen is the secretion of melanin production in the hair bulb and apoptosis of follicular melanocytes.
Catagen phase is also known as transitional phase allows the follicle to renew itself.
It lasts about two weeks, the hair follicle shrinks due to the disintegration and the papilla detaches and rests.
Hair is not growing during this phase, the length of the terminal fibres increases when the follicle pushes them upward.[11]

3.Telogen phase :

This is the final stage of hair growth. During this stage the hiar follicle is dormant or resting and hairs are easily lost.
About 10 to 18 %of all hairs are in the telogen stage.

The follicle then remains inactive for 3 months and the whole process is repeated.
This is also known as resting phase. During the telogen or resting phase the follicle remains dormant for 1 to 4 months.
In this phase, epidermal cells lining the follicle channel continue to grow as normal and may accumulate around the base of the hairs.
At same point, the follicle will begin to grow again softening the anchor point of the shaft initially.
The base will break free from root and the hair will be shed. Within two weeks the new hair shaft will begin to emerge once the telogen phase is complete.
This process result in normal hair loss known as shedding.[25]

4.Exogen phase :

For the long hair shedding functions hair been assumed to be part of telogen phase, but now it has been established that shedding actually occurs as distinct phase termed as exogen phase.
The newly formed hair fibres pushes the resting shaft outward to affect hair shedding.
A possible role of desmoglein and proteolytic events which has been suggested.[19]

5.Kenogen phase :

Scientists observed a novel phenomenon in hair cycling when they used phototrichogram to study hair growth the empty hair follicles were noticed even after shedding of the hair fibres.
The term ‘kenogen’ was coined to describe the interval of the hair cycle in which the hair follicle remains empty after the telogen hair has been extruded and before new anagen hair reappears[3].
It is normal to observe kenogen in healthy skin. each hair follicle is independent and goes through growth cycle at different times. Otherwise all the hair would fall at once.[9]

HAIR LOSS : Hair are protein filaments that grow from follicles in the skin. The hair of mammals is one of their most distinctive features. Hair is most commonly associated with hair development, hair types and hair care, but it is also an important biomaterial composed mainly of proteins,especially alpha-keratin. Dandruff, hair loss, dry hair, split ends, frizzy hair, dull hair, heat damage, color damage, gray hair and other problems are common in cosmetics. There are many products on the market such as hair oils, hair shampoos, conditioners, hair serums, hair gels, hair masks and hair dyes that help treat these problems.Hair loss is characterized by partial or total hair loss and is classified as a chronic dermatological disorder.The prevalence of hair loss has increased due to stress and dietary factors. Significantly associated with this condition is an excess of testosterone in the blood capillaries; as such, antiandrogens have been reported to reduce hair loss[16]
Hair loss whether baldness or noticeably lacing hair can be for colorful reasons. occasionally hair loss is a side effect of a health problem that needs to be addressed and will remedy itself when the health problem is dulytreated. However, it’s important to see a dermatologist to get to the root of the problem and figure out how to stop hair loss or renew growth, If you are dealing with lacing hair or baldness.[18]

Factors affecting hair loss:

1. Hormone Disturbances:
"Excess androgens, or male sex hormones, and hormonal imbalances are the most common causes of hair loss such as androgenetic alopecia," claims Michele Green, MD, a cosmetic dermatologist in New York City. Both female and male pattern baldness are influenced by androgens.[6]
2. Thyroid Problem:
Because each ailment results in a hormonal imbalance, hair loss can be brought on by either an underactive thyroid (medically referred to as hypothyroidism) or an overactive thyroid (hyperthyroidism). Hair loss may also be influenced by autoimmune thyroid disorders like Hashimoto's thyroiditis and Graves' disease.[23]

3.Pregnancy:

Hair loss can result from other hormonal abnormalities as well, particularly the dramatically shifting hormone levels that follow pregnancy and childbirth.

4. Particular Drugs:

The American Hair Loss Association claims that a variety of drugs used to treat common health issues might cause hair loss as a side effect. Another name for this is "drug-induced hair loss."

Oral contraceptives, antidepressants, anti-inflammatories, beta and calcium channel blockers, and medications for depression can all cause baldness or hair thinning. [32]

5. Different Forms of Alopecia Areata (AA):

The medical word for hair loss is alopecia, and alopecia areata refers to an autoimmune disorder in which your immune system targets and kills your hair follicles, preventing the development of new hair.

6. Other Autoimmune Diseases:

Additional Autoimmune Conditions There are numerous autoimmune illnesses that can result in hair loss, with alopecia areata being just one of them. According to DermNet NZ, autoimmune disorders including lupus and Hashimoto's thyroiditis are two more conditions that can cause hair loss. It's possible that this particular hair loss won't always be reversible; occasionally, it might be permanent. The loss of hair, however, might be somewhat offset by drugs and surgical hair restoration.[33]

7. Stress:

According to Green, "Hair loss can be brought on by a great deal of stress, such as getting sick or having surgery that puts stress on the body and mind." Many people have acute telogen effluvium, which causes up to 70% of hair follicles to enter a resting (telogen) state as opposed to the estimated 10% to 20% of hair follicles that are ordinarily in the telogen state.[30]

8. Nutrient Deficiencies:

The hair growth cycle and cellular turnover, deficiencies in a few vitamins and minerals might result in hair loss and reduced hair growth.According to the AAD, inadequate protein, biotin, zinc, and iron are just a few examples of vitamin deficiencies that can result in hair loss.[27]

9. Extreme Hair Care:

According to the American Academy of Dermatology Association, you can actually break your hair significantly when trying to make a fashionable hairstyle, which could lead to hair loss and thinning. Too much pulling on the hair, such as when blow-drying it or putting it in a too-tight ponytail, or excessively touching the scalp can all cause hair loss.[11]

SOME SEVEARE PROBLEM ASSOCIATE WITH HAIR

- Alopecia Areata
- Telogen Effluvium
- Scalp Folliculitis
- Scalp Psoriasis
- Seborrheic Dermatiti

THERAPEUTIC PROPERTIES OF ROSMARINUS OFFICINALIS L.

To explore how rosemary leaf extract can benefit your hair, we must first examine its ingredients and their combined healing properties.The main chemical compounds of rosemary extract are α-pinene, 1,8-cineole, camphor, rosmarinic acid, carnosic acid and borneol. These substances are found in both rosemary oil and rosemary leaf extract, although in different concentrations, and are known to have the following properties[1]

- Anti-inflammatory
- Antifungal
- Antibacterial
- Antioxidant
- Analgesic (pain relieving)
- Vasodilation (improving blood flow)

Rosemary leaf extract and rosemary oil offer roughly the same benefits for hair and scalp health. The main reason why rosemary leaf extract is more often found in hair and scalp care products than rosemary oil is that rosemary oil does not always mix well with other ingredients.

There's been a lot of excitement surrounding this humble plant in recent years and with good reason. Unlike many growth promoting ingredients, rosemary's ability to improve scalp health and promote hair growth is well documented.[14]

IMPROVING CIRCULATION

Improving blood circulation to the scalp is one possible mechanism by which rosemary leaf extract stimulates hair growth. In this study, rosemary was shown to improve blood flow in these areas, possibly by stimulating the cells that line blood vessels (endothelial cells) and facilitating the movement of platelets.[3]Rosemary leaf extract can stimulate hair follicles and encourage faster hair growth by improving blood circulation in the scalp. Vasodilators such as rosemary can also reduce hair loss by ensuring that new hair is thick, healthy and well attached to the scalp.[18]

STIMULATING NERVE FUNCTION

Hair and scalp care products containing rosemary leaf extract can be especially beneficial for people with limited hair growth due to damage to the nerve endings in the scalp.The results show that a topical formulation containing rosemary extract was able to accelerate tissue regeneration and restore nerve endings around hair follicles.This effect is thought to be due to rosemary's carnosic acid content, as this compound may have nerve-stimulating properties.[30]

BENEFITS OF ROSMARINUS OFFICINALIS L. OIL TO TREAT HAIR LOSS

There is ample evidence that serums, conditioners and shampoos containing rosemary oil or rosemary leaf extract can stimulate hair growth in people with relatively healthy scalps.A growing body of research also shows that rosemary can treat hair loss and promote new hair growth in people with androgenetic alopecia. Let's look at some of the more common causes of hair loss and how rosemary can help with regrowth in each case.[26]

PROMOTES HAIR GROWTH

Rosemary extract is known for its ability to stimulate hair follicles, which can promote hair growth. When applied to the scalp, rosemary oil increases circulation and transports oxygen and nutrients to the hair follicle. This stimulation of the follicles can help strengthen existing hair and promote the growth of new hair fibers.[22]

Studies have shown that rosemary oil can effectively promote hair growth, making it a popular choice for those looking to improve the health and thickness of their hair.

- Stimulates hair follicles: Rosemary extract has been shown to increase circulation to the scalp, which stimulates hair follicles and promotes hair growth.
- Improves Scalp Health: The anti-inflammatory and antibacterial properties of rosemary oil help maintain a healthy scalp, which is essential for optimal hair growth.
- Improves hair quality: Rosemary oil can strengthen the hair shaft, making it less sensitive and improving overall hair quality.
- Prevention of dandruff: Rosemary oil creates an ideal environment for hair growth by removing dandruff and keeping the scalp clean[16].

Improves the health of the scalp

Using rosemary extract for hair not only stimulates hair follicles and promotes hair growth, but also improves the health of the scalp. The anti-inflammatory and antioxidant properties of rosemary oil help reduce the inflammation and irritation of the scalp, making it beneficial for people with dandruff.[14]

In addition, rosemary extract has been linked to potential stress reduction, which may help prevent premature graying of hair. If you want to add rosemary oil to your hair care routine, focus on applying it directly to the scalp, give it time to work, and make sure you're using pure rosemary oil with no added fragrance.[16]

MECHANISM ACTION OF ROSMARINUS OFFICINALIS L.

Because of its fatty acid content, blood circulation, and anti-microbial and anti-inflammatory qualities, rosemary oil has shown to be a natural solution worth trying for people who want to increase their hair growth. With a few easy tips and tactics, you may use this essential oil in your hair care routine whether you have fine or coarse hair.[30]

- Antimicrobial: The antimicrobial qualities of rosemary oil can aid in the eradication of dandruff and encourage a healthy scalp.
- Anti-inflammatory: The oil soothes and lessens inflammation on the scalp due to its anti-inflammatory qualities
- Improved circulation: Applying rosemary oil to the scalp can increase blood circulation, which aids in the development of new hair
- Has fatty acids: The oil has fatty acids that feed hair follicles and supply vital nutrients for strong, healthy hair development.[29]

The antibacterial effects of rosemary (Rosmarinus officinalis) are mainly attributed to its essential oils, which include cineole, camphor, and borneol. It has been discovered that these substances possess antibacterial properties against a range of bacteria, fungi, and viruses.

Other Uses of Rosemary for for Hair

1.Scalp itchiness relief

If you have an itchy scalp, rosemary oil can help. Its natural anti-inflammatory and antiseptic properties can soothe the scalp and relieve discomfort. Here are some ways to use rosemary oil for an itchy scalp.[25]

2.The benefits of mental wellness

a. Better memory: Greek researchers used rosemary essential oil to improve memory, and a study published in the International Journal of Neuroscience found that it can significantly improve memory quality and mental alertness.

b. Stress relief: Inhaling the aroma of rosemary essential oil can reduce blood levels of the stress hormone cortisol. Its anti-stress properties can help combat chronic stress and promote relaxation.

c. Improved mental energy: Rosemary oil can refresh the mind and calm the body, making it a popular choice in aromatherapy for mental clarity and focus.[26]

d. Calming Effects: Rosemary essential oil has a woody scent that can calm the mind, reduce anxiety and promote general well-being.

FORMULATION OF ROSEMERY HAIR OIL

Since complementary and alternative medicine is one of the most widely used forms of treatment worldwide, 60–80% of developing nations use it. Hair oils are widely used in dermatology and are considered to be among the most popular natural products. The natural, nontoxic, nonpollutive, and biodegradable essential oils have many medicinal uses and little chance of negative side effects.[22] For more than a century, anecdotally, hair loss has been treated with ,coconut oil,rosemary, bringaraj,fenugreek, hibiscus castor oils. Research has also been done on the possible benefits of other medicinal herbs for increasing hair growth. Compared to other topical the hair oil posses superior physical, microbiological, and chemical stability, and the manufacturing method is quiet easy. Therefore, the goal of the investigation was to create hair oil with essential oils of rosemary and other medicinal plant, both alone and together, and assess how well they enhanced hair growth in an animal model.[32]

Materials and Method

Materials

Herbal ingredient:

Coconut oil, rosemary essential oil, fenugreek seeds powder, hibiscus flower powder, amala powder, castor seeds oil.

INGREDINTS USE IN ROSEMERY HAIR OIL

ROSMARINUS OFFICINALIS L :

Name of drug : Rosemery
Family : Lamiaceae
Genus : Romsarius L.
Species : officinalis
Order : Lamiaceae
Biological source : Oil of Rosemary is distilled from the flowering tops of leafy twigs of Rosmarinus officinalis, belonging to
family lamiacieae[20]

Morphologiacal character

Apperance :The plant has a grayish-green appearance. The thick, leathery leaves resemble needles, with dark green up surface.
Colour : grayish green (leaves), purple (flowers).
Odour: : herbal camphoreous woody, aromatic minty balsamic medicinal phenolic.
Taste : Rosemary offers an earthy, woodsy flavor with subtle notes of pepper, lemon and mint.
Category : antioxidant , antimicrobial, antifungal.
Leaves : needles shaped leaves[21]

Chemical constituents :

Rosemary extract contains phenolic acids, flavonoids, and diterpenoids, showcasing antioxidative and antimicrobial qualities.
Rosmarinus officinalis L contain rosmarinic acid, eucalyptol, camphene, borneol, camphor, caryphayllene, terpineol,
Phellandrene.[21]

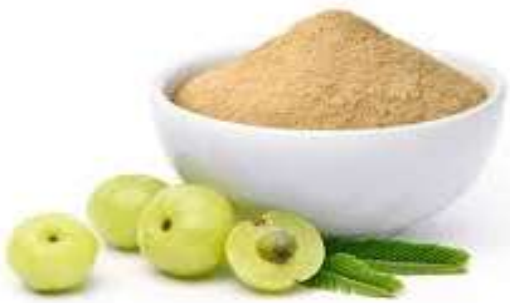
Uses :

Promotes Hair Growth. Androgenetic alopecia is quite common. It is often called male pattern baldness.
Rosemary oil can reduce inflammatiol may reduce tissue inflammation that can lead to swelling and pain.
Improves mood and sleep in some people, improve digestive health and detoxification.[20]

EXCIPIENT PROFILE

1. Amla (phyllanthus emlica)

Name of drug : Amla
Synonym : Emblica officinals,Indian gooseberry.
Family: Euphorbiaceae
Genus: phyllanthus L
Species: phyllanthus EL
Order: euphorbiales
Biological source: This is consist of dried, as well as fresh fruit pericarp of the plant Emblica officinalis Gaerth Phyllanthus emblica Linn.found in India, south East Asia,srilanka.[5]



Morphological character :

Appearance: It grows about 8-18m height with thin light grey bark
Colour: greenish yellow (flower); globose, fleshy, pale yellow(fruit)
Odour : smells like lemon
Taste: slightly bitter and sour
Category: antioxidant , anti-diabetic, anti-inflammatory
Leaves: simple, pinnate[6]
Chemical constituent :
Emblica officinals is very high in vitamin c, polyphenol compound, pectin, phyllantidine, gallic aid , ellagic acid, also found hydrolysable tannins punigluconin, pedunculagin and emblicanin and emblicanin B.[7]

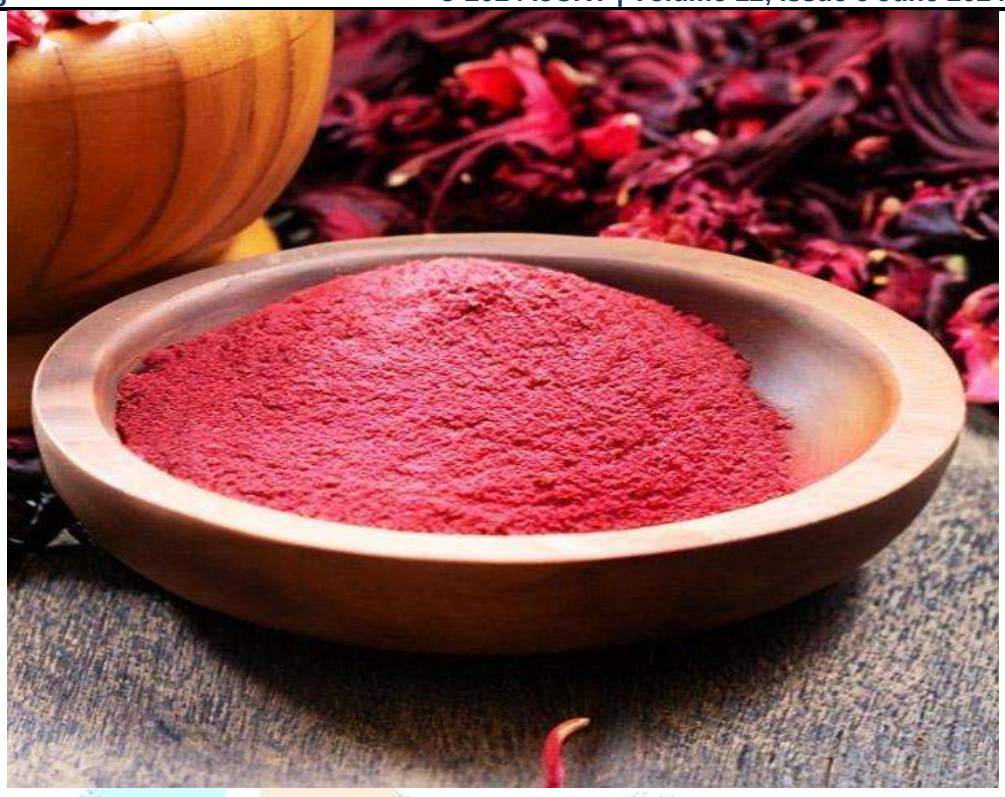
Uses:

Reduces amount of free radicals associated with aging.Enriches hair growth and pigmentation.Increases urination and thus eliminates unwanted toxins. Absorbs calcium and keeps body looking great and healthy.Improves immunity and protects body against infection.Treats menstrual cramps and fever.Flushes out toxin that causes diarrhea and dysentery. Aids, digestion, improves, appetite and helps gain weight.[7]

2. Hibiscus (Hibiscus rosa-sinensis)

Name of drug:- Hibiscus
Synonym: shoeblack plant, mahagua, mahoe, cotton rose, roselle
Family: malvaceae
Genus: shoeblackplant
Species: H.rosa-sinensi
Order: malvales

Biological sources: hibiscus, (genus hibiscus), genus of numerous species of herb, shrubs, and trees in the mallow.[7]



Morphological character:

Appearance:- Hibiscus rosa-sinensis is a bushy, evergreen shrub or small tree growing 2.5–5 m tall and 1.5–3 m wide, with glossy leaves and solitary, brilliant red flowers in summer and autumn.The 5-petaled flowers are 10 cm in diameter with prominent orange-tipped red anthers

Colour:- white to pink, red, blue, orange, peach, yellow or purple

Odour:- most hibiscus flowers have no scent, some have modest fragrance

Taste:- sweet, sour

Category:- flowering plant

Chemical constituent: The chemical components that are the main active principles in the physiological activities of Hibiscus sabdariffa L. calyx are anthocyanins.[5]

Uses :

Stop hair loss.make your hair look healthy and lustrous.prevent premature graying.thicken hair and add volume.treat dandruffcondition against frizz, dryness, and breakage, prevent split ends.[5]

3.Fenugreek seed (Trigonella foenum-graecum)

Name of drug: fenugreek seeds

Synonym: Trigonella, greek clover, trigonella foenumgraecum, methi

Family: fabaceae

Genus:trigonella

Species:T.foenum graecum

Biological source: fenugreek consists of dried seeds of trigonella foenum graecum in the family fabaceae,it is native in south

eastern Europe and west asia, cultivatd in india.[5]

Morphological character:

Appearance: The slender pods are up to 15 cm (6 inches) long, curved and beaked, and contain yellow-brown seeds—flat

rhomboids characterized by a deep furrow, less than 0.5 cm (0.2 inch) long

Colour: Cuboid, yellow- to amber-coloured

Odour: maple syrup-like odour.

Taste: bitter taste

Category: antidiabetic, anticarcinogenic, hypocholesterolemic, antioxidant, and immunological activities.

Chemical constituents: carbohydrates, proteins, lipids, alkaloids, flavonoids, fibers, saponins, steroidal saponins, vitamins,

and minerals, nitrogen compounds.[15]

Uses:

Fenugreek hair oil boosts blood circulation and helps reduce dandruff. Fenugreek seeds are rich in protein, and nicotinic acid

content, renowned for their capacity to fight hair fall and dandruff. It also treats dryness of hair, controls balding, and hair

thinning.Reduce the risk of diabetes, improve milk production and flo,improve weight loss, raise testosterone and boost

sperm count and also reduce inflammation.[6]

4. Castor seed oil (Ricinus communis)

Name of drug : castor seed

Family : Euohorbiaceae

Genus: Ricinus

Species : ricinus communis

Biological Source : Ricinus communis, the castor bean or castor oil plant, is a species of perennial flowering plant in the spurge.[14]

Morphological character:

Appearance :The fruit is a spiny, greenish (to reddish-purple) capsule containing large, oval, shiny, bean-like, highly poisonous

seeds with variable brownish mottling.

Colour : Greenish to reddish purple

Odour : faint characteristic odour.

Taste : bland but slightly acrid taste[5]

Category :Castor oil like all other plant oils is a vegetable triglyceride.

Chemical constituent :The composition of castor oil is mainly composed of fatty acids and neutral lipids (triglycerides). Other

minor biological active compounds that consist of unsaponifiable fractions such as carotenoids, phenolics, phospholipids,

phytochemicals, phytosterols, tocopherols, and tocotrienols are also present in the oil.

Uses : Depending on its intended use, castor oil can be taken orally or applied topically. Some people take it orally as a laxative as a way to induce labor in pregnancy. Others apply the oil directly to the skin and hair for its moisturizing benefits.[7]

5.**Coconut oil (Cocos nucifera)**

Name of drug: coconut oil

Synonym: prunus dulcis, coconut butter, copra oil

Family :Arecaceae

Genus: cocos L- coconut palm

Species :nucifera

Order: Arecales[13]

Biological source: coconut oil is the expressed from the dried solid part of endosperm of coconut, cocos nucifera L. largely

cultivated in African and southeast asian countries.

Morphological character:

Appearance: They are ovoid in shape, 30-45 cm in length and 15-20 cm in diameter.

Colour: it is white solid fat below 25 degree celcius and clear thin liquid oil in warmer climates.[22]

Taste: unrefined coconut oil boasts a delicious, tropical coconut scent and refined coconut oil has a neutral scent and flavor.

Category: anthelmintic, anti-inflammatory,antioxidant,antifungal,antimicrobial

Chemical constituents: caprylic acid,capric acid, lauric acid, palmitic acid,stearic acid,oleic acid, linoleic acid.[27]

Uses:

The oil and milk derived from it are generally used in cooking and frying. Coconut oil is also extensively used in soaps and cosmetics. The husk and leaves can be used as materials to make several products for furnishing and decorating.

Coconuts have been used in traditional remedies around the world to treat several ailments, starting from sore throat, colds.

Recent medicinal research has observed that coconut may have antibacterial, antifungal, anthelmintic and antiviral properties, among other health benefits.[29]

Procedure

- Herbs are weighed by using weighing balance where as oils are Measured through pipette
- The oils herbs are mixed together in a vessel.
- The above mixture is then allowed to boil on low flame with continous stirring. So, as to avoid the adherence of the medicinal plants to the bottom of the vessel.
- At this step moisture of the medicinal plant commenced to evaporate so it is agitated frequently and carefully to ensure that the mixture does not stick at the bottom of vessel.
- The are taken out from time to time to know the condition and stage if mixture of oils.
- As further heating to the content, the oil starts to form a forth. This is the condition where all the active ingredients of medicinal plant starts to concentrate in oil.
- In the next step, the mixture is filtered through muslin cloth.
- The collected strain is final herbal hair oil product.[32]

Evaluation test for rosemary hair oil

The formulated rosemary oil was evaluated for parameters like pH, acid value, saponification value, refractive index, viscosity and organoleptic parameters.[30]

1.**Saponification value** :Value of saponification After precisely weighing 2g of oil, it was put into a 250ml iodine flask. After adding 25 milliliters of 0.5M alcoholic potassium hydroxide, the mixture was reflux-cooked for 30 minutes on a water bath. As an indicator, phenolphthalein was added, and the mixture was titrated against 0.5M HCl . A similar blank was carried out without the sample. Three copies of the outcome were obtained. Saponification Value: 28.05 was obtained.

2.**pH** : pH of the herbal oil was detected using pH strip.[29]

3.**Viscosity** : Viscosity was determined using Ostwald's viscometer

4.**Specific Gravity** :Using a specific gravity bottle, the prepared oil's specific gravity was ascertained. Three copies of the result were obtained. The ratio of a solid's weight in air to the difference between its weight in air and its weight submerged in water is known as its specific gravity. There are two standard techniques for figuring out a liquid's specific gravity.

5.Organoleptic property : Colour and Odour was determined manually.

6.Irritation test: To test for skin irritation, oil was applied to the hand and left in the sun for five minutes.[14]

Conclusion :

The formulated polyherbal hair oil was examined for physical and biological assessment parameters, and the results were within acceptable limits.[20]

Referance :

1.UniProt. Taxonomy—Rosmarinus Officinalis (Rosemary) (Salvia Rosmarinus). Available online: https://www.uniprot.org/taxonomy/39367 (accessed on 6 March 2020).
2.Hussain AI, Anwar F, Chatha SAS, Jabbar A, Mahboob S, et al. (2010) Rosmarinus officinalis essential oil: antiproliferative, antioxidant and antibacterial activities. Brazilian Journal of Microbiology 41: 1070-1078.
3.Christina Macdonald, (1981), Garden Herbs for Australia and New Zealand, ISBN 0-589-01409-9.
4.Al-Sereiti MR, Abu-Amer KM, Sen P. Pharmacology of rosemary (Rosmarinus officinalis Linn.) and its therapeutic potentials. Indian J. Exp. Biol. 1999;37(2):124–130. [PubMed] [Google Scholar].
5.WHO. World Health Organization; Geneva: WHO monographs on selected medicinal plants.http://apps.who.int/medicinedocs/en/d/Js2200e/ [Google Scholar]. 6.Comissão Permanente da Farmacopeia Portuguesa. Farmacopeia Portuguesa (7th Edition) Ministério da Saúde; Lisbon, Portugal: 2003. [Google Scholar].
6.Rosmarinus officinalis (rosemary)". Centre for Agriculture and Bioscience International. 3 January 2018. Retrieved 1 April 2023.
7.McCoy, Michael (27 June 2012). "The good graces of rosemary". The Gardenist. Archived from the original on 16 November 2018. Retrieved 10 April 2015.
8.An Evidence-Based Systematic Review of Rosemary (Rosmarinus officinalis) by the Natural Standard Research Collaboration,Catherine Ulbricht, PharmDTracee Rae Abrams, PharmDAshley Brigham, PharmDJames Ceurvels, PharmD
Jessica Clubb, PharmD,Whitney Curtiss, Pharm,Catherine DeFranco.
9.Begum A, Sandhya S, Shaffath Ali S, Vinod KR, Reddy S, Banji D. An in-depth review on the medicinal flora Rosmarinus officinalis(Lamiaceae). Acta Sci. Pol. Technol. Aliment. 12(1), 61–73 (2013).
10. Ayyanar M, Ignacimuthu S. Medicinal plants used by the tribals of tirunelveli hills, Tamilnadu to treat poisonous bites and skin diseases. Indian J Tradit Knowl 2005; 4(3): 229-36. [http://nopr.niscair.res.in/handle/123456789/8509].
11. Gousia Begum S, Sekar M, Ravikumar K. Sekar Keerthana. Design and evaluation of herbal hair oil formulations by using ethanolic exract of Ziziphus jujuba leaves. Int J Pharma Bio Sci 2017; 8(3): 322-7.

12. Fatima Grace X, Rahul Raj S, Shanmughanathan S. Chamundeeshwari. Preparation and evaluation of polyherbal hair oil. International journal of pharmaceutical chemistry and analysis 2014; 1(1): 2394-797.

13. Murata, K.; Noguchi, K.; Kondo, M.; Onishi, M.; Watanabe, N.; Okamura, K.; Matsuda,

H. Promotion of Hair Growth by Rosmarinus officinalis Leaf Extract. Phytother. Res. 2013, 27, 212–217. [Google Scholar]

14. Phillips TG, Slomiany WP, Allison R. Hair loss: common causes and treatment. Am Fam Physician. 2017;96(6):371-378. PMID: 28925637

15. Hargaran, S., & Sood, S. (2022). Understanding Essential Oils for Hair Growth and its Mechanisms of Action. Current Pharmaceutical Design, 28(15), 1670-1679.

16.Panahi, Y., Taghizadeh, M., Marzony, E. T., & Sahebkar, A. (2015). Rosemary oil vs minoxidil 2% for the treatment of androgenetic alopecia: a randomized comparative trial [Abstract]. Skinmed, 13(1), 15-21.

17. Shin HS, Won CH, et al. Rosemary oil vs minoxidil 2% for the treatment of androgenetic alopecia: a randomized comparative trial. Am J Clin Dermatol. 2007;8(5):285-90. doi: 10.2165/00128071-200708050-00003.

18. Hillmann K, Garcia Bartels N, et al. A randomized, double-blind, placebo-controlled trial of rosemary oil in the treatment of androgenetic alopecia. J Am Acad Dermatol. 2011 Dec;65(6):1126-1134.e2. doi: 10.1016/j.jaad.2010.09.724.

19. Hillmann K, Bartels NG, et al. A randomized, double-blind, placebo- and

active-controlled, half-head study to evaluate the effects of fractional CO2 laser resurfacing on alopecia areata lesional skin. Skin Pharmacol Physiol. 2015;28(5):236-44.

20. Hernández, M.D.; Sotomayor, J.A.; Hernández, A.; Jordán, M.J. Rosemary (Rosmarinus officinalis L.) oils.In Esential Olis in Food Preservation, Flavor and Safety; Preedy, V., Ed.; Academic Press: London, UK, 2016;pp. 677–688

21. Sousa-Borges, R.; Sánchez-Ortiz, B.L.; Matías-Pereira, A.C.; Keita, H.;

Tavares-Carvalho,J.C. Rosmarinus officinalis essential oil: A rewiew of the phytochemistry, anti-inflammatory activty, and mechanims of action Involves J. Etnopharmacol. 2019,229, 29–45.

22. Rosemary Oil is as effective as Minoxidil for Androgenetic Alopecia by Henry Tianus January 04, 2023.

23. Androgenetic Alopecia: Therapy Update by Shivali Devjani,Ogechi Ezemma,Kristen J. Kelley,Emma Stratton',Maryanne Senna[1]2.

24. Rosemary (Rosmarinus officinalis L., syn Salvia rosmarinus Spenn.) and Its Topical Applications: A Review by Lucas Malvezzi de Macedo 1,Érica Mendes dos Santos 2,Lucas

Militão 3,Louise Lacalendola Tundisi 3,Janaína Artem Ataide 3,*ORCID,Eliana Barbosa Souto 4,5ORCID and Priscila Gava Mazzola 3,*ORCID.

25. Rohan k, Shilpa SK, Jadhav SL.Development of polyherbal hair oil. World journal of pharmaceutical and medical Research. 2018;4(3): 242-246.

26. Joshi AA, Dyawarkond pm. Formulation and evaluation of polyherbal hair oil,International journal of green phrmacy 2017;11(1):135-139.

27. Indian pharmacopeia, of India ministry of Health and family welfare, published by,The Controller of publication, Edition, volume 2nd (1996).

28. H.N.more ,A.A.Hajare. practical hand book of physical pharmacy page no- 27-28,154, 249-250.

29. Rohan k, Shilpa SK, Jadhav SL.Development of polyherbal hair oil. World journal of pharmaceutical and medical Research. 2018;4(3): 242-246.

30. Sapna Gautam Suneet Devivedi*,kushagra Dubcy and Hemanth Joshi.,Ujjain Institute of pharmaceutical science, chandresera, Dewas Road, UJJAIN -456010 (m.p) India.ISSN 0972-768X.

31. Garg.A.D.aggarwal. S. Garg.and A.K sigla.2002.spreding of semisolid formulation Anupdate.pharmaceutical technology.september:84-102.

32. Martin,Alfred. (2008).farmasi fisika Dasar-Dasar formasi fisika Dalam ||mu farmasetik Ed.ketiga jakarta:vipress.

33. x.fatima Graa, S.Rahul Raj, S. shanmighanathan D. Chamundeeshwari preparation evaluation of poly Herbal Hair oil. Volume.1, No.1,October 2014