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Preparation and Preliminary Evaluation of Polyherbal Hair Oil

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ABSTRACT

Hair is one of the fundamental pieces of the body and has no vital function in humans, yet its psychological function is extremely important. It imparts a youthful and attractive look to both males and females. The basic part of hair is bulb, root and shaft. Hair loss problem is of great concern to both males and females. Hair loss is a dermatologic disorder may be due to the hair fading, dandruff & falling of hair. The presence of number of phytochemical constituents in the poly-herbal hair oil have dual work, one that the formulation is used as a cosmetic for hair-care and the other that the presence of phytochemical amend the hair care and protection, which naturally results in healthy hair. So, our main objective is to prepare polyherbal hair oil formulation by using Piper betel, shikakai, almond oil, tulasi, neem, hibiscus, curry leaves, coconut oil and jasmine oil. The developed oil formulations were subjected for evaluation. It includes physical (organoleptic parameters, specific gravity, pH and viscosity), chemical (saponification value and acid value) and biological evaluation (sensitivity test) respectively. The all parameters are within the standards.

Keywords: - Polyherbal hair oil, Dermatological disorder, healthy hair, cosmetics Evaluation

INTRODUCTION

Hair is a vital, attractive and beautifying part of the body. Hair is a simple structure and is made up of a protein filament keratin. It influences the appearance of people and also affects the self-esteem of both genders. Healthy hair is an indication of the overall wellbeing of a person.

Herbal products have been widely used by individuals as home remedies. With the invention of modern medicines, the use of herbal products has been down, but in recent times the use of herbal

medicines has increased tremendously because they are safe, natural, non-toxic, easily available and compatible with all skin types when compared to synthetic products [1]. Herbal plant ingredients found in gels, oils, face packs, tonics and creams have been shown to be more beneficial than synthetic formulations containing chemical components. Natural origin ingredients impart

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smoothness, lustre to the hair, and help in treating various hair problems like hair fall, grey hair, dandruff, baldness, and dry hair. Herbal cosmetics help in enriching the body with various essential nutrients and minerals [2].

Hair problems occur due to deficiency of vitamin C, E, B₆, B₁₂, D, E, biotin, amino acids, omega fatty acid, minerals like iron, selenium, copper, calcium, zinc, hormonal imbalances, stress, environmental and genetic factors [3].

Herbal hair oils are formulated with herbal extracts in an oil base [4]. In our study, we have formulated herbal hair oils from Beetle leaf, shikakai, almond oil, tulasi, neem, hibiscus, curry leaves, coconut oil and jasmine oil extractions with different ratios and concentrations. The formulated hair oils are evaluated by physical (organoleptic parameters, specific gravity, pH and viscosity), chemical (saponification value and acid value) and biological evaluation (sensitivity test) respectively.

Based on the thorough literature survey, Beetle leaf, shikakai, almond oil, tulasi, neem, hibiscus, curry leaves, coconut oil and jasmine oil were selected for the preparation of poly-herbal hair oil because there was no hair oil prepared with these herbs.

Piper betle

Piper betle Linn. Commonly known as Betel leaf, belongs to the genus *Piper* of the plant family Piperaceae [5]. Betel leaves are known to be antioxidant, antiseptic, bactericidal and fungicidal. The ability of betel leaf as a medicinal plant is due to the many active compounds contained in it, such as essential oils, fatty acids and fat esters [6]. While the identified betel extract contains alkaloids, flavonoids, tannins, steroids, vitamin E and triterpenoid which are antibacterial [7,8].

Acacia concinna

Acacia concinna Linn, is commonly known in India as shikakai and belongs to family Fabaceae and the fruits of this plant are traditionally used for washing hair, for promoting hair growth, as expectorant, purgative [9]. Its pharmacological properties are antioxidant, anti-coagulant, anti-platelet, anti-thrombotic, antidermatophytic and immune adjuvant [10,11].

Prunus amygdalus

Prunus amygdalus belongs to family Rosaceae, has been traditionally used for dark spots of skin, and some other skin problems like fungal infections, urticaria, dry itching, dandruff, acne, hair loss, for healing wounds, haemorrhoids and as analgesic in joint pains. Almonds are rich in lipid-soluble and in small amounts of water-soluble (B₁, B₂, B₃, B₅, B₆, B₇, B₉) vitamins [12]. The most abundant minerals in almond kernels are calcium, iron, magnesium, sodium, zinc, manganese, and selenium. The nuts of *Prunus amygdalus* are found to possess various pharmacological properties, such as anti-stress [13], antioxidant [14], immunostimulant [15], lipid lowering [16] and laxative [17].

***Ocimum sanctum* Linn.**

Ocimum sanctum is commonly called as Tulsi and belongs to family Lamiaceae, traditionally used to treat wound, bronchitis, liver diseases, fever, ophthalmia, gastric disorders, genitourinary disorders, skin diseases, stress disorders, migraine headaches, arthritis, night blindness, influenza, ulcers and infections of mouth [18]. Essential oil of Tulsi was capable of enhancing normal hair growth and promoting follicular proliferation in controlling chemotherapy induced hair loss and reported address to alopecia [19].

Hibiscus rosa sinensis

Hibiscus rosa sinensis has been used for ages in Ayurveda to cure many ailments. The flowers of *Hibiscus rosa-sinensis* have been reported to possess wound healing, antibacterial and immunomodulatory properties. Several studies have proved the presence of anti-oxidant, anti-fungal, and antimicrobial properties in flowers of *Hibiscus rosasinensis* [20]. Hibiscus leaves and flowers are rich in anthocyanins and phenolics, minerals like calcium, phosphorus and iron, vitamin B1, riboflavin, niacin and vitamin C which stimulate and promote thicker hair growth and prevent premature greying of hair. Phytosterols, triterpenoids and flavonoids found in flower extract are advantageous for hair growth [21]. Hibiscus is used for rejuvenating the hair growth and for controlling dandruff [22].

Murraya koenigii

Murraya koenigii is commonly called as Curry leaf (Rutaceae). The curry leaves are rich in Vitamin C, Vitamin A, minerals, proteins, carotene, nicotinic acid, calcium, alkaloids, flavonoids, terpenoids and koenigine [23,24]. It has been reported to have antioxidant, antimicrobial, anti-inflammatory, anticholinesterase and anti-amnesic activity. Curry leaves boiled with coconut oil is an excellent hair tonic for retaining natural hair tone and stimulating hair growth. The essential oil from curry leaf is also utilized by perfume, soap, cosmetic and aromatherapy industry [25].

Cocos nucifera

Cocos nucifera (L.) is commonly known as coconut and belongs to the family Arecaceae. Phytochemical studies of the coconut phenols, tannins, leucoanthocyanidins, flavonoids, triterpenes, steroids, and alkaloids [26], triterpenes, saponins, and condensed tannins [27]. Coconut oil is traditionally used as antipyretic, diuretic, to prevent hair loss and possess wound healing activities respectively [28,29].

Azadirachta indica

Azadirachta indica A Juss, commonly known as Neem and belongs to family Meliaceae. Neem extracts were reported to possess anticancer, antimicrobial, anti-inflammatory, anti-arthritic, antipyretic and antidiabetic activities [30,31]. Several active phytochemicals such as Nimbin, Saladin,

azadirachtin, glycosides, and dihydrochalcone polyphenolics, coumarin, and tannins are present in neem [32,33].

Jasminum officinale

Jasmine oil is an essential oil derived from the white flowers of the common jasmine plant, also known as *Jasminum officinale* (Family *Oleaceae*). For centuries, jasmine has been popular for its sweet, romantic fragrance and has been used in some of the world's best-known perfumes. Jasmine contains alkaloids, coumarins, flavonoids, tannins, terpenoids, glycosides, emodine, leucoanthocyanins, steroids, anthocyanins, phlobatinins, essential oil and saponins. *Jasminum officinale* was also used traditionally for the treatment of urinary tract infections, as CNS depressant, sedative, mild anaesthetic and astringent. It was also used for coughs, laryngitis, dysmenorrhoea, labour pains, skin problem such as dry, greasy, irritated, sensitive skin, and for muscular spasms and sprains [34].

MATERIALS AND METHODS

Collection and authentication of plant materials

The Polyherbal hair oil was prepared by collecting and using various plant materials these are, betel leaves, shikakai, almond oil, tulasi, neem, *Hibiscus*, curry leaf, coconut oil and jasmine oil are collected from Chickballapura local market. Collected plants were authenticated by B.K. Venkatesh, (Retired), professor, Department of Botany, First Grade College, Chickballapura, Karnataka. The collected materials were processed for preparation of hair oil.

Formulation of polyherbal hair oil

Formulation of oil was prepared by using different formulation compositions as mentioned in table 1. The dried crude drugs were made into coarse powder using mixer. Now almond oil and coconut oil is added. Now contents were boiled for 30 min and were filtrated through muslin cloth. Coconut oil was added to make up volume and jasmine oil is added to provide fragrance at end. Finally, prepared polyherbal hair oil was placed in amber colour bottle.

Evaluation of poly herbal hair oil

The polyherbal hair oil was subjected to physicochemical and biological evaluation parameter like pH, acid value, Saponification value, viscosity, specific gravity, organoleptic property and sensitivity test. Determinations of these parameters are very essential to assure the quality, safety, and efficacy of this formulation [35].

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 and F₄ were applied on test site. The test site was observed for erythema and oedema for 5 to 6 hrs [36].

Acid value

Preparation of 0.1molar solution weighted 0.56g of KOH pellets and dissolved water and stirred continuously. The prepared 0.1 molar KOH solution was filled in the burette. Preparation of sample: measured 10ml oil and dissolved in 25ml of ether mixture and shocked. Added 1ml of phenolphthalein solution and titrate against with 0.1molar KOH solution. The acid value of the prepared oil was calculated by using formula [36].

$$\text{Acid value} = 5.61n/w$$

Where, n= number of ml 0.1 molar KOH, w= weight of oil

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 30 mins. Phenolphthalein was added as indicator and titrated against 0.5m HCl (a). Similarly blank was performed (b) without the sample. The saponification value of the prepared oil was calculated by using formula [36].

$$\text{Saponification value} = 28.05 (b-a)/w$$

Where, W= weight in gram of the solution.

pH

pH of the poly herbal hair was detected using pH meter. Take the formulated oil in beaker individually now deep the pH meter in beaker and wait for 1 minute till the reading come, as the pH meter show the reading note it down individually. Before using pH meter deep it into the water [35].

Viscosity

Viscosity is determined by means of Brook field's viscometer. In which firstly take sample of prepared oil and then use spindle no 63 for viscosity determination now start brook field viscometer and wait for 1 min and reading is noted down in centipoise [35].

Specific gravity

Take two specific gravity bottles, rinsed it with distilled water, dry it in oven for 15min, cool, closed it with cap and weight it (a). Now fill the same specific gravity bottle with the sample and closed it with cap and again weight it (b). Determine the weight of sample per millilitre by subtracting the weight (b-a) [35].

Refractive index

It was determined by using refractometer.

Organoleptic property

Organoleptic properties such as colour, odour was determined manually.

RESULTS AND DISCUSSION

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. The pH of oil was found to be 6.3 to 6.8 which was relevant with human skin.

The herbal hair oil was prepared from various herbs (Table 1) provides best mixture of vitamins, minerals, amino acids, antioxidants and essential oils. Formulation development was done with the optimized formula and evaluated by mean of various parameters like sensitivity test, colour, odour, irritation test, grittiness test, specific gravity, pH, viscosity, acid value and saponification value. The results are depicted in the Table 2. 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.

Table 1: Formulation compositions of different prepared polyherbal hair oil formulation

S.No.	Name of the ingredients (common name and botanical name)	Quantity of ingredients for 100 ml			
		F ₁	F ₂	F ₃	F ₄
1	Betel leaf, <i>Piper betle</i> L.,	8.1 g	8.5g	9g	9.5g
2	Shikakai <i>Acacia concinna</i>	3g	3.5g	3.8g	4g
3	Almond oil, <i>Prunus amygdalus</i>	30ml	25ml	25ml	20ml
4	Tulsi, <i>Ocimum Tenuiflorum</i> ,	2.5g	2.5g	2.5g	3g
5	Neem, <i>Azardiracta indica</i>	4.3g	4g	3.5g	3g
6	Hibiscus, <i>Hibiscus rosasinensis</i>	7g	7.5g	7.9g	8g
7	Curry leaves <i>Murraya koenigii</i>	4.5g	5.5g	5.8g	7.5g
8	Coconut oil <i>Cocos nucifera</i>	q.s	q.s	q.s	q.s
9	Jasmine oil	0.1ml	0.1ml	0.1ml	0.1ml

Table 2: Evaluation of polyherbal hair oil

S.No.	Parameter	Observation of poly herbal hair oil			
		F ₁	F ₂	F ₃	F ₄
1	Acid value	2.01	1.85	1.97	1.87
2	Saponification value	154.27	142.5	182.3	134.7
3	pH	6.3	6.8	6.3	6.6
4	Specific gravity	0.85	0.89	0.88	0.90
5	Viscosity	1.82 ^{poise}	1.88 ^{poise}	1.91 ^{poise}	1.97 ^{poise}
6	Refractive index	1.77	1.5	1.2	1.7
7	Sensitivity test	Non-sensitive	Non-sensitive	Non-sensitive	Non-sensitive
8	Colour	Olive green	Dark olive green	Dark olive green	Dark olive green
9	odour	Aromatic	Aromatic	Aromatic	Aromatic

CONCLUSION

Formulated polyherbal hair oil provides best mixture of vitamins, antioxidants, essential oils, and also provides nutrients of hair growth. 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.

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