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Research Article

Formulation And Evaluation of Neem Based Shampoo

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ABSTRACT

The present study focuses on the formulation and evaluation of an herbal shampoo using Azadirachta indica (Neem) as the principal active ingredient. Neem is well-known for its antimicrobial, anti-inflammatory, and antifungal properties, which make it a suitable candidate for hair and scalp care formulations. The shampoo was prepared using herbal ingredients and evaluated for various physicochemical parameters such as pH, foam ability, dirt dispersion, surface tension, solid content, and conditioning performance. The formulation was found to be stable and effective in cleansing the scalp, reducing dandruff, and maintaining hair texture. The study supports the use of Neem in the development of cost-effective, eco-friendly, and safe herbal shampoos.

INTRODUCTION

In world, where sustainability and healthconscious choices are gaining importance, today's neem-based shampoos have emerged as a natural and eco-friendly solution for hair care. Neem (Azadirachta indica), a medicinal tree native to the Indian subcontinent, has been valued for centuries for its antibacterial, antifungal, and soothing properties. When infused into shampoos, neem offers a gentle yet powerful way to maintain scalp health, combat dandruff, and promote strong, lustrous hair Unlike conventional shampoos that often contain harsh chemicals, neem-based shampoos use plant-derived ingredients, making them biodegradable and environmentally friendly. Their natural composition ensures minimal water pollution and reduced exposure to synthetic additives, benefiting both consumers and the planets This article explores the benefits of neembased shampoos their role in sustainable hair care, and why they are an ideal choice for individuals seeking a holistic approach to hair health Neembased shampoo is an eco-friendly and effective approach to hair care, especially for those aiming for a natural and sustainable alternative. Neem (Azadirachta indica) is well- known for its antibacterial, antifungal, and anti- inflammatory

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properties, making it highly beneficial for scalp health.Since ancient times, humans have learned a lot from nature to care for health, skin and hair as Natural ingredient with preventive, protective, and corrective properties, making them a Valuable resource in the realm of cosmetics. Nature provides so many versatile nature Ingredients that can enhance the beauty of both skin and hair. Hair serves as an external Indicator of internal body conditions, and shampooing is the most common method of hair Treatment the primary purpose of shampoo is to cleanse the hair by removing accumulated sebum, Dust, scalp debris, and other impurities. Different shampoo formulations cater to various hair Types, care habits, and specific issues like oily hair, dandruff, and androgenic alopecia. Shampooing remains the most widely practiced form of hair treatment, with shampoos primarily serving as cleansing agents for both hair and scalp. Herbal shampoo are shampoo. That infused with the extracts of natural ingredients. These shampoos have ability to yield Superior and long-lasting results. They are formulated without harsh chemicals, ensuring Minimal damage to the hair. Natural cosmetics are popular one all over the world as they Convey the impression of having better purity Neem-Based Shampoo: An Eco-Friendly and Effective Approach to Hair Care Neem, a powerful. Natural ingredient, has been used for centuries in traditional hair care due to its antibacterial. Antifungal, and nourishing properties. Neem-based shampoos offer an ecofriendly alternative to Chemical- laden hair products, promoting healthy hair and scalp without harming the environment. Rich in antioxidants and essential nutrients, neem helps combat dandruff, soothe scalp irritation, and strengthen hair follicles, making it an ideal choice for sustainable and effective hair care. As consumers increasingly seek natural solutions, neem-based shampoos stand out as a responsibly and beneficial option for both personal well-being and environmental

conservation Introduction. In recent years, there has been a growing demand for natural and ecofriendly personal care products as consumers become more conscious of the environmental impact and potential side effects of synthetic ingredients. Among various natural solutions, neem-based herbal shampoo has gained popularity due to its numerous therapeutic properties and sustainability. Neem (Azadirachta indica), known for its antibacterial, antifungal, and antiinflammatory properties, has been used in traditional medicine for centuries to treat various scalp and hair issues, including dandruff, itching, and infections. Combining neem extract with other natural ingredients like aloe vera, lavender oil, and mild surfactants results in a shampoo that not only cleanses effectively but also nourishes and protects the hair and scalp. Unlike conventional shampoos that often contain harsh chemicals like sulfates and parabens, neem-based herbal shampoos are formulated with biodegradable and plant- derived ingredients. This makes them not only gentle on hair and scalp but also environmentally sustainable, reducing the risk of water pollution and ecological harm. The purpose of developing a neembased herbal shampoo is to offer a safe, effective, and eco-friendly hair care solution that caters to the modern consumer's preference for natural and sustainable products. Through this study, we aim to formulate and evaluate the physicochemical properties, performance. stability, and eco-friendliness of the shampoo, thereby establishing its potential as a reliable alternative to synthetic shampoos. Here's a potential introduction for a neem-based herbal shampoo The demand for eco-friendly and sustainable personal care products has been on the rise in recent years, driven by growing concerns about the environmental and health impacts of conventional chemical-based products. Hair care is one area where consumers are seeking. Natural and effective alternatives to traditional shampoos.



Neem, a plant with a rich history of use in traditional Indian medicine, offers a promising solution. This paper explores the development of a neem- based herbal shampoo as an eco-friendly and effective approach for hair care the development of sustainable and eco-friendly hair care products by exploring the potential of neem as a natural ingredient. The findings of this research can provide valuable insights for the development of effective and environmentally friendly hair care products, promoting healthy hair growth and scalp health while minimizing harm to the environment. The World Health Organisation (WHO) states that 80% of the population in poor nations receives. Their primary medical care from ethnomedicines [1]. On the other hand, half of the population The World world's Health Organisation (WHO) states that 80% of the population in poor nations receives their primary medical care from ethnomedicines [1]. On the other hand, half of the world's population Sqtill uses traditional medicines made from the active components of plants. Plant components and Parts are traditionally utilized in ethnomedicine to cure a variety of illnesses. The most adaptable and Practical medicinal plant discovered to date is neem (Azadirachta indica A. Juss). Every component of it is abundant in bioactive chemicals, which have long been utilized to treat a varietv of illnesses, including infectious infections. Neem's nimbolide, azarirachtin, and gedunin are examples of bioactive chemicals that are said to have remarkable abilities to control a wide range of biological processes both in vivo and in vitro. A. indica has been used from prehistoric times to the present [2]. Said to have been practiced in south India between 10,000 and 4000 B.C., Siddha medicine is thought to be the oldest medical system. According to Tamil literature, the first plant to be included in the Siddha system was neem, also known as margosa [3]. Because the adverse effects of older antibiotics

were severe, the use of natural medicines instead of synthetic or chemical medications has increased recently [4-6]. Herbal components are found in medicines. Herbs can be used as plant extracts or as their active components directly. Because of the powerful antibacterial properties of herbal treatments and their benefits for basic healthcare, most individuals on this earth also use them. indica has been researched as a biopesticide and as an anticancer, antimicrobial, anti-inflammatory, and chemo preventive agent. Additionally, it has been observed that differentiated cell tissue in A. indica culture produces active metabolites for various uses. On the other hand, not much research has been done on its possible application in cosmetics. For instance, the majority of research elucidated the antibacterial characteristics in medical diseases like dandruff, acne, and personal hygiene [7–8]. Using commercial neem, diluted neem extract with coconut oil, aloe vera, vitamin E, and pure neem leaf extract, a range of neem-based lotions were developed for stability testing using various formulations [9]. The neem extract was kept at 25 °C for a year and at 45 °C for three months. At 25 °C, none of the produced lotions showed signs of color changes or layer separation. After a year of analysis, the moisture level stabilized and no granules formed. The neem-based lotion with coconut oil and aloe vera mix had the highest level of stability. The sample did not exhibit any layer formation, the role of the healthy human stratum corneum (SC) acid mantle in maintaining the skin's natural Antibacterial activity and other bioprocesses like lipid production and desquamation [10–12]. A prior Study set out to find out if a skincleansing product was gentler on the skin since its pH was the same as the skin's pH [13]. The study used a well-established Forearm Controlled Application Test (FCAT) Protocol in clinical studies to compare "skin pH" cleansing systems with neutral pH cleansing systems. The findings demonstrated that, in comparison to

skincleansing with neutral systems pН Circumstances, those that formulated are exclusively or mostly with anionic surfactants under skin pH conditions may cause more skin dryness and irritation. The role of the healthy human SC acid mantle in maintaining the skin's natural antibacterial activity and other production bioprocesses like lipid and SC desquamation. On human samples, heterogeneity in S. aureus viability was noted [14]. Several studies have been reported on the stability of neem-based soaps [15-18]. The seed extract Of Parkia speciosa Hassk was effectively used to create novel gold nanoparticles (AuNPs) [19]. Because of its hydroxyl functional group, this natural plant extract functions as a natural bioreductor, demonstrating the presence of flavonoids. For thirty days, AuNPs show outstanding stability colloids in hand soap with no appreciable changes to the particle size or structure. This work offers a simple Method for producing AuNPs with exceptional stability for possible use in cosmetics, particularly Hand soap products. The bioefficacy of neem insecticidal soaps (NIS) in reducing the occurrence of Bhendi disease (Abelmoschus esculentus (L.) Moench) in a field setting was developed [20]. To addresses. This issue, a laboratory formulation of Neem Insecticidal Soap (NIS @ 2%) was created, and its Effectiveness was assessed. The field treated with NIS yielded the highest percentage of fruit (59.26 q/ha), whereas the fields treated with neem gold yielded the lowest percentage (53.31 q/ha) and the control field yielded the highest (53.25%). Therefore, it has been determined that using NIS to control the Bhendi yellow vein mosaic virus (BYVMV) will maximize their output at a minimal cost and without compromising the environment.

Anatomy of Hair :-

The hair is made up of 95% keratin protein. Each Hair has a hair shaft and hair root Hair is a protein Filament that grows from follicles found in dermis. The hair shaft consists of a cortex and cuticle cells. And a medulla for some types of hair. The hair structure consists of 3 different parts.

Medulla: It is the innermost laver of the hair Shaft, made up of a Substance. Amorphous, soft, oily Substance

Cuticle: Thin protective outer layer that Contains nutrients beneficial for hair growth. It is highly keratinized with cell shaped like Scales that are layered one over the other. Measuring about 60 micrometers long and About 6 micrometers wide.

Cortex: It is the main constituents of the hair, containing long keratin chains which gives elasticity, suppleness and resistance to the hair. The cells of the cortex are joined together by an intercellular cement rich in lipids and proteins.

Growth Cycle of Hair air growth cycle consists of four phases: Anagen (growth phase): It is the growing phase. The anagen phase is when your hair grows your hair follicle forms a new hair shaft

Catagen (transitional phase): During this phase the hair follicle shrinks and hair growth slows.

Telogen (resting phase): It is the resting phase where hair growth stops and new hair begins the growth phase, pushing the old hair out.

Exogen phase (last phase): It is hair growth cycle where hair strand completely detaches from the scalp and sheds off.

Function of shampoo :-

- 1. It should effectively wash the hair
- 2. It should effectively and completely remove dirt or soil.



- 3. It should produce a good amount of foam to satisfy the user.
- 4. It should be readily removed by rinsing with water.
- 5. Should impart a pleasant fragrance to the hair.
- 6. It should not have any side effects or causes irritation to the skin and eye.

PLANT MATERIAL

Neem extract: -



Fig no. 1 Neem

Synonyms; Melia azadirachta

Common name; Sanskrit: Nimba, Arishta, Ravipriy Kannada: Bevinamara, Bevu. Kahibevu.

Biological Source ; It consists of Leaves and other aerial parts of Azadirachta indica.

Family: Meliaceae

Plan description: a medium to large evergreen tree, also known as Indian Lilac, with a rounded crown and thick, furrowed bark Chemical constituents: limonoids like azadirachtin, nimbin, nimbidin, and geduni

Synonyms: Aloe perfoliata vera

Uses;

- Health
- Immune system
- Antioxidant
- Diabetes

Procedure

- Preparation of Plant Extraction
- Firstly take fresh and healthy leaves of Neem and Tulsi.
- Then washed it with purified water and dried pulverized in air.
- Make the heat assembly and boiled the Neem and he extraction was prepared by using simple maceration process.



Fig no. 3Aloe vera Extract

Tulsi leaves in 100ml of purified water separately and filter it with filter paper.

- And extract the Aloe vera jelly from Aloe vera leaves.
- > The total extract was combined and filtered.
- The evaporation of solvent was completed by using heating mental.
- Store in a container for further use.[11]





Fig no. 4 Neem Extract

A) Preparation Process of Anti-dandruff Shampoo

- 1. Neem and Tulsi Extracts are mix with each other
- 2. Next add the Aloe vera jelly and mix it gently.
- 3. Then add liquid Castile soap very slowly and stirred it. No foam can be form.
- 4. Then add tea tree essential oil and lavender essential oil.
- 5. And make quantity sufficient with purified water. [12,13]

B) Pharmaceutical Evaluation of Formulation:

The formulation were evaluated for different pharmaceutical parameter [12,13]

viscosity. The rheological evaluation show that the

viscosity of samples changes gradually with the

was calculated Consistency can be defined as the

	F1	F2	F3
Physically appearance	Physically appear, good	Physically appear,	Physically appear,
	foam	good foam	good foam
Odour	Lavender	Lavender	Lavender
Transparency	Not transparent		Not transparent
	_	Not transparent	
Colour	Yellowish green	Yellowish green	Yellowish green

Viscosity

Table 4: Evaluation of formulation for physical appearance, viscosity, pH

pH:-

The pH of prepared shampoo was carried out by using digital pH meter. Dissolving 1ml of shampoo in 100ml of water.[14]

The prepared shampoo pH was found to be 6.5-6.7



The resistance of fluid (solid, liquid or gas) to change in shape or movement of neighboring portion soft relative to mean other is called



Fig no. 5 pH test



way in which the substance or sample hold together the uniformity or prosperity. [17,18]

Eg. The formulated shampoo has the consistency like smooth cream butter.



Foam Stability Test: -

50ml of the 1% shampoo solution was placed into 250-ml graduated cylinder which was then shaken 10 times. The total volume of the foam content after 1 min of shaking is recorded at RT (Room Temperature). The height of the foam produced was measured rapidly. Foam ability and foam stability although foam generation has title to do with the cleansing ability of shampoos. All the five observation of formulated shampoo showed similar Characteristics in distilled water. The foam retention ability of all samples are given in table below. Three formulations observations showed comparable foaming activity. The final formulation produced stable foams there was little change in foam volume [19,20].



Fig no . 6 Cylinder shaking method was used for determining the foam stability test.

Table no. 1 Evalution test						
Formulations	Appearance	pН	Viscosity	Dirt Dispersion		
F1	Yellowish green,	7.37	310	100		
	Good foaming					
F2	Yellowish green,	7.20	280	100		
	Good foaming					
F3	Yellowish green,	7.03	400	100		
	Good foaming					



Time in min	F1	F2	F3
1 min	165	170	170
2min	168	168	167
3 min	170	164	164
4min	165	165	168
5min	163	164	164

RESULTS:

The present research work was the preparation and evaluation of herbal anti-dandruff Neem shampoo. The evaluation parameters such as physical properties, pH, viscosity, consistency, solid content and foam stability of shampoo gives good results was shown in table number 3, 4 and 5.

CONCLUSION

Preparation of herbal anti-dandruff Neem shampoo was done and further evaluated parameters such as physical properties, pH, viscosity, consistency, solid content and foam stability and of shampoo and gives good results.

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