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Formulation and Evaluation of Herbal Soap of Neem and Tulsi

Mr. Pawar Avinash Rajebhau and Prof. Sanap A. S.
Kishori College of Pharmacy, Beed, India

Abstract: *Herbal products have become an item of global importance both medicinally and economically. Although usage of these herbal products has increased, their quality, safety and efficiency are serious concerns in industrialized and developing countries. The present research has been undertaken with the aim to formulate and evaluate the pure herbal formulation. A herbal soap was formulated using the leaf and bark extract of Azadirachta indica, tulsi Ayurvedic cosmetics are also known as the herbal cosmetics the natural contentin the herbs does not have any sideeffect on the human body. Most herbal supplement are based on several botanical ingredients with long histories of traditional or folk medicine usage. Among the numerous botanical ingredients available in the market today. Numerous chemical toxins microorganism present in the atmosphere may cause chemical infection anddamage to skin cosmetics alone are not sufficient to take care of skin and body parts. Neem (Azadirachta indica) tree has attracted worldwide prominance owing to its wide range of medicinal properties, neem leaves and its constituents have been demonstrated to exhibit anti–inflammatory, antihyperglycemic, antiulcer antimalarial, antifungal, antibacterial, antimutagenic and anticarcinogenic properties. This study was conducted to evaluate the effect of aqueous ethanolic and ethyl acetate extract from neem leaves.. The physicochemical parameters of formulations (Physical evaluation, pH, Foaming ability and foam stability) were determined. The results showed that formulation have pH level nearly equal to skin pH, Foaming index is excellent.*

Keywords: Herbal products

I. INTRODUCTION

Herbal soap preparation is a medicine or drugs it contain Antibacterial & antifungal agents which e mainly uses of part of plants such as like leaves, stem, roots &fruits to treatment for a injury or disease or to achieve good health. Herbal cosmetics are also known as ―Natural cosmetics . Herbal cosmetics are products which are used to purify and beautify the skin. The main advantage for using an herbal cosmetic is that it is pure and does not have any side effects on the human body; instead enrich the body with nutrients and other useful minerals. Soap is a solid product made from oil by means of saponification In .Neem leaf and its extractexhibi immunomodulatory anti- inflammatory, antiulcer antimalarial, antifungalant ibacterialantioxidant anticarcinogenic property. Tulsi is called the queen of all herbs, it is used widelyin Ayurvedic and naturopathic medicines which helps in the healing of the human body in anatural manner. Not only do Tulsi leaves benefit people, but their flowers too. Tulsi can helpyou get rid of many health problems ranging from fever to kidney stones.The presentscenario, it seems improbable that herbal soaps , although better in performance and saferthan the synthetic ones, will be popular with the consumers .

Soaps and detergents have been registering steady growth in demand in the country, in tunewith the industrial and economic growth. Herbal soap has generated considerable interest andenthusiasm amongst the consumers in recent times, due to ecofriendly nature of the product.There is good scope for setting up herbal soap projects in the country. While there is noparticular entry barrier from the point of view of technology, adequate market thrust isnecessary to competitively sell the product in the market. The toilet soap consumption inIndia is estimated at 1200000 tonnes per annum. The soap market is growingat the rate ofabout 9% per annum.

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In recent years, there has been a growing awareness and demand for herbal and natural skincare products, especially those derived from traditional medicinal plants. This is largely due to concerns over the side effects of synthetic chemicals and a shift toward eco-friendly, sustainable, and skin-friendly alternatives. One such area gaining popularity is herbal soap, which combines natural cleansing with therapeutic benefits.

Neem (Azadirachta indica) and Tulsi (Ocimum sanctum) are two widely used medicinal plants in Ayurvedic and traditional systems of medicine. Neem possesses antibacterial, antifungal, and anti- inflammatory properties, making it effective in treating skin infections and improving skin health. Tulsi, on the other hand, is known for its antiseptic, detoxifying, and antimicrobial properties. When combined, these herbs offer a potent formulation ideal for cleansing, healing, and nourishing the skin. This project focuses on the formulation and evaluation of a herbal soap using extracts of Neem and Tulsi. The aim is to create a safe, effective, and economical alternative to synthetic soaps, suitable for all skin types and beneficial in the treatment and prevention of common skin ailments such as acne, eczema, and bacterial infections.

The prepared formulation is evaluated on various parameters including pH, foamability, foam retention, hardness, and antimicrobial activity to assess its effectiveness and stability. The study seeks to not only contribute to the development of a consumer-friendly herbal product but also promote the use of natural resources in personal care applications. The skin is the largest organ of the human body and acts as a protective barrier against harmful environmental factors. Maintaining skin hygiene is essential not only for personal health and appearance but also to prevent infections. Soaps are indispensable personal care products used globally for cleansing purposes. However, the widespread use of synthetic soaps, which often contain harsh surfactants, artificial fragrances, and preservatives, can lead to skin dryness, irritation, allergies, and environmental pollution.

To overcome these concerns, there has been a growing interest in herbal and natural formulations, especially in the skincare industry. Herbal soaps made from medicinal plants and essential oils are perceived as safer, more environmentally friendly, and skin-compatible alternatives. They are biodegradable, rich in therapeutic compounds, and generally free from harmful chemicals.

Importance of Herbal Soaps:

Herbal soaps utilize the medicinal benefits of plants which have been traditionally used in Ayurveda and other folk systems of medicine. They not only cleanse the skin but also provide nourishment, moisturization, and protection from microbial infections. In particular, plant-based actives like Neem and Tulsi have gained scientific validation for their efficacy in dermatological applications.

Purpose of the Project:

The primary purpose of this project is:

- To develop an herbal soap formulation using aqueous or alcoholic extracts of Neem and Tulsi.
- To evaluate its physical, chemical, and antimicrobial properties.
- To compare the performance of the herbal soap with commercial synthetic soaps

II. LITERATURE REVIEW

Ashlesha Ghanwat, Sachin Wayzod and Vanjire Divya (in year 2020)

The plant Azadiricta india, Ocimum tenuiflorum , Sapindus mukorossi and Acacia concinna were extracted using water and subjected to various evaluation test according to previous research the antimicrobial activity of Neem was studied . the prepared formulation when tested for different test gave good results . It does not give any irritancy to skin it was determined by using these soap by few volunteer hence it is proved that soap does not give any irritancy to skin . Furthermore the prepared soap were standardized by evaluating various physico chemical properties such as pH appearance odour in which the exhibit satisfactory effect.

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Satish Kumar Sharma and Suruchi Singh (in year 2020)
In the prior studies it was noted that Nosocomial infection has been recognized as a crucial issue in the outcome of hospital care, resulting in significant morbidity and mortality. The primary routes of infection transmission to patients are the hands of health-care workers. Many of the antiseptics are sanitizers that dependenton alcohol and can have deleterious effects. Their regular use can cause irritation of the skin. Therefore, herbal hand-wash was prepared using herbal extract T. catappa, C. longa and G. indica.

Rakesh K. Sindhu*1 , Mansi Chitkara2 , Gagandeep Kaur1 , Arashmeet Kaur1 , Sandeep Arora1 and I.S. Sandhu (in year 2019)
The evaluation parameters carried for standardizing the herbal soap by color determination, pH, TFM, ethanol soluble content, Saponification value were carried out. This led to an outcome of the formulation of stable Polyherbal soap possessing potent antimicrobial activity against various micro-organisms such as E. coli and S. aureus.
Singh, R., and Yadav, S. (2019)
The study focused on the development of herbal soaps using Azadirachta indica (Neem) and Ocimum sanctum (Tulsi) along with other herbal extracts. The formulated soap was evaluated for parameters such as foaming capacity, cleansing efficiency, stability, and pH. Results showed excellent antibacterial activity, particularly against Staphylococcus aureus and Escherichia coli. The study confirmed that Neem and Tulsi have synergistic effects when combined, enhancing the antimicrobial potency of the formulation. The soap was found to be skin-compatible and suitable for daily use.

Patel, R., and Shah, N. (2018)
This research emphasized the importance of using traditional herbs in modern skincare products. Herbal soap containing Neem, Tulsi, and Aloe vera was formulated and tested for skin irritation, pH level, and antimicrobial properties. The study highlighted the effectiveness of Neem and Tulsi in preventing common skin conditions like acne and fungal infections. The herbal soap maintained a pH close to that of human skin (between 5.5–6.5), making it ideal for regular use. The formulation was also found to be biodegradable and eco-friendly, supporting sustainable cosmetic practices.

Bhosale, A. M., and Patil, K. (2021)
The research aimed to formulate a polyherbal soap using aqueous extracts of Azadirachta indica, Ocimum sanctum, and Triphala. The study evaluated the soap's physical properties such as hardness, foaming ability, washability, and stability. Antimicrobial activity was assessed using the disc diffusion method, showing that the herbal soap had a significant inhibitory effect against bacterial strains like E. coli and Pseudomonas aeruginosa. The herbal soap was found to be cost- effective and comparable in effectiveness to commercial antiseptic soaps.

Kadam, P., and Joshi, A. (2017)
In their study, the authors prepared and evaluated herbal soap using extracts of Neem, Tulsi, and Lemon. The objective was to combine antibacterial, antioxidant, and cleansing properties in a single formulation. The prepared soap was evaluated for its physical attributes (colour, pH, odour, foam retention) and showed excellent results. The antimicrobial study confirmed the inhibitory action of the herbal soap against gram-positive and gram-negative bacteria. The soap also scored well in sensory evaluation, suggesting consumer acceptability

III. AIM AND OBJECTIVE

Aim

To study the formulation development and evaluation of herbal antibacterialsoap ofneem (Azadirachta indica) & tulsi (Ocimum tenuiflorum).

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Objectives:

The ultimate aim of this study is to formulate and evaluate the herbal antibacterial soapusing extracts of plant having ethnic and dermatological importance in Ayurveda,namely,Neem Azadirachta indica, and Tulsi Ocimum tenuiflorum

To study the evaluative parameters such as :-

pH

Foam retention

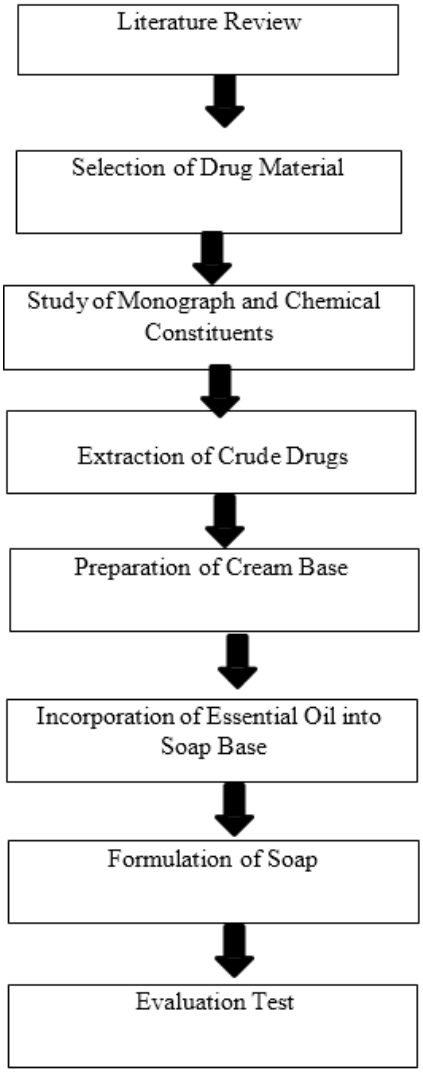
Foam height

Moisture Content

Cleansing Ability

Skin Irritation

Plan Of work



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III. MATERIALS & METHOD

NEEM

Monograph :-

Common Name – Neem.

Scientific Name- AzadirachataIndica.

Biological Source- Almost all part of plant AzadirachataIndica.

Family- Meliaceae, the mahogany family

Kingdom- plant.

Fig: Neem

Neem is an omnipotent tree and a sacred gift of nature. Neem tree is mainly cultivated inthe Indian subcontinent. Neem is a member of the mahogany family, Meliaceae. Today itis known by the botanical name Azadirachtaindica *(*A. indica*)* SarvaRogaNivarini – the curer of all ailments Role of AzadirachataIndica is as a wonder drug is stressed as far back as 4500 years ago.

Importance of NEEM :-

Some of its health restoring benefits Effective in skin infection, rahes & pimples.

Immunity booster, Anti obesity, Blood purifier for beautiful & healthy skin, Anti diabetic, Anti viral, Dispels intestinal worms and parasites, Malaria, Piles, Hair disorder& Oral disorders.

Neem is rich in fatty acids, including oleic, stearic, palmitic, and linoleic acids.

Neem is used to treat psoriasis and eczema.

neem has been used to treat acne, reduce blemishes, and improve skin elasticity neem leaf extract accelerates wound healing through an increased inflammatory response and the formation of new blood vessels.

Constituents:-

Flavonoids,
Alkaloids,
Azadirone,
Nimbin,
Nimbidin,
Terpenoids
Steroids,
Margosicacid,
Vanilic acid,
Glycosides,
B-sitosterol,
Nimbectin,
Kaempeerol,
Quercurserti
are present in Neem Leaf

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Tulsi :

MONOGRAPH :-

Common Name – Tulsi

Scientific Name- Ocimum tenuiflorum

Biological Source- leaves OfTulsi

Family- Lamiaceae

Kingdom- plant

Fig: Tulsi

Tulsi is called the _Holy Basil‘ in India with reference made to it in the Holy Scriptures. In its native India, it has been cultivated for nearly 2,000 years. Healers call it tulsi, the Queen of Herbs, the "Incomparable One," and it is prominent in Ayurveda and Hinduism for its various therapeutic applications. For skin care, the properties come it‘s impressiveantioxidant abilities and for how it acts as a stress relieving agent .

Importance of TULSI :-

Owing to its healing, antibacterial, antifungal anti-inflammatory properties

Tulsi benefits the skin by preventing blackheads, acne and relieves skin infections, toname a few.

Rich in vitamin K andantioxidants

Tulsi benefits hair by stimulating blood circulation and promoting hair growthamongst others. .

Tulsi has skin and hair benefits. It contains camphene which works as a natural tonerto remove excess oil in the skin.

Tulsi neutralizes free radicals and rejuvenates the skin, reviving the youthful glow.

Chemical Constituents Of Tulsi Are:

Oleanolic acid

Ursolic acid

Rosmarinic acid

Eugenol,

Carvacrol

Linalool

β-caryophyllene

vitamin A

Benefits of Neem and Tulsi Soap :-

Natural Soap is HighlyMoisturising.

Better Ingredients Used.

Cruelty-Free and Animal-Friendly.

Wider Choice.

Better for the Environment.

Rich in Antioxidants.

Fights Against FreeRadicals

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Acts as an antibacterial clearing up skin irritations and acne.
It is smooth, soft and gentle without leaving a residue or sticky film
Rejuvenates the skin, reviving the youthful glow.
A Herbal soap should have the following characteristics:
It should remove dirt and sweat from your body.
It should leave your skin feeling clean and refreshed.
It should nourish and soften your skin.
It should purify and protect skin from environmentaldamage
It should moisturize your skin.
It should have a pleasant odour

Plant Materials:-

Neem :-

The Neem leaves were collected from different matured plant.
Cracked and dry skin can be moisturised and made smooth by using neem.
It acts as an Antibacterial, Antifungal, Antioxidant agent.
Neem has been used to treat acne, reduce blemishes, and improve skin elasticity.
Neem is rich in fatty acids, including oleic, stearic, palmitic, and linoleic acids.

Tulsi :-

Tulsi is well known for its myriad medicinal properties — antibacterial, antifungal, antipyretic, antioxidant, antiseptic and anticancer. Helps beat stress. Tulsi is a natural herb with anti-stress qualities
Tulsi is rich in Vitamin C and zinc , Rich in vitamin K and antioxidants.Tulsi benefits the skin by preventing blackheads, acne and relieves skininfections.
It contains camphene which works as a natural toner to remove excess oil in the skin.
Tulsi neutralizes free radicals and rejuvenates the skin, reviving the youthful glow.

Chemicals Glycerin :-

Glycerine is a nontoxic, odorless, and colorless liquid.
Glycerine is used as a humectant in soap products.
Glycerine will make sure that your skin will maintain its own moisture in order toprotect it from damage caused by dryness .
It can increase skin hydration, relieve dryness, and refresh the skin's surface.
It's also an emollient, which means it can soften skin

Ethanol:-

Ethanol is most often used when making glycerin soap.
Ethanol has the ability to dissolve on a partial level in water and oil.
It helps in making soap transparent.
Ethanol can be used as Antiseptic , Antidote and as Medicinal solvent

Steric Acid:-

Stearic Acid helps to harden products, such as candles and soap bars.
It's usually used as a thickening agent .
Stearic acid is an emulsifier, emollient, and lubricant
Stearic acid is used mostly in the manufacture of soaps, detergents, and severalother cosmetics such as shaving creams and shampoos.

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Sodium lauryl sulphate :-
Sodium lauryl sulfate (SLS) is asurfactant
sodium lauryl sulfate helps to stabilize and thicken solutions with ingredients of differing solubility.
It allows products to achieve a more uniform texture for easier, and smooth reapplication.
It makes soap foamier

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It allows products to achieve a more uniform texture for easier, and smooth reapplication.
It makes soap foamier

PROCEDURE :-
Extraction :-
The Azadirictaindica powder and Tulsi leaves was extracted with water bydecoction process.
9 gm of above stated powder of neem and Tulsi leaves were taken in separate conical lask and extracted with water for 40-60 min with occasional agitation.
Then filtered.

Fig– Extraction of Neem and Tulsi

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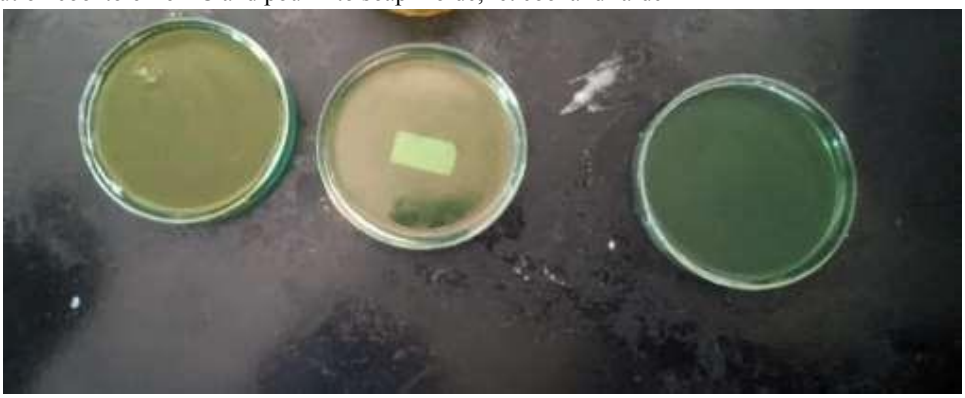
Preparation of lye:-

Lye solution was prepared by mixing 0.8g NaOH and 1.5ml DI H2O in125ml beaker.
Measure 9.3ml Propylene glycol, 3.2ml Vegetable glycerine
Add 9.5ml 95% Ethanol solution, 7.5g Sodium lauryl sulfate into250mlbeaker on hot plate with stir bar.
Heat mixture to 60°C.

Preparation of Soap:-
6.5g Stearic acid and heat mixture to 68°C.
When at temperature slowly add the 50:50 lye solution and mix for 20 minutes while continuously stopping and starting stirring until mixture becomes transparent.
Further required quantity of Azadirachta indica and Tulsi extract was mixedto the above mixture and volume made up to 100 ml by adding remaining distilled water.
Let solution sit for 1 hour at68°C.
Few crystals of menthol were also added to impart aroma to the prepared soap.
Let soap solution cool to 62-64°C and pour into soap molde, let cool and harden



DRUG & EXCIPIENT PROFILE

Tulsi MONOGRAPH :-

Common Name – Tulsi
Scientific Name- Ocimum tenuiflorum
Biological Source- leaves OfTulsi
Family- Lamiaceae
Kingdom- plant
Neem Monograph :-
Common Name – Neem.
Scientific Name- AzadirachataIndica.
Biological Source- Almost all part of plant AzadirachataIndica.
Family- Meliaceae, the mahogany family
Kingdom- plant

IV. RESULT AND DISCUSSION

Result:-

Among all the formulations the formulation f2 in both table 1 and 2 exhibited good result . The physicochemical parameters such as color, odor, appearance, and pH were tested.The pH of the soap was found to be 6.5 with pH strip . Remaining parameters such as foam height, foam retention moisture content, and were also determined .
Foam Height was found to be:- 2.7 FoamRetention was found to be:- 5.4 min Moisture Content in soap is:- 6.83%

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Discussion:-

Fig :- Herbal Neem And TulsiSoap

V. CONCLUSION

The formulated soap showed considerable antibacterial activity as the commercial standard and all the other parameters were good.

The plant Neem and Tulsi were extracted using water and subjected to variousevaluation test according to previous research the antimicrobial activity of Neem wasstudied . the prepared formulation when tested for different test gave good results . It does not give any irritancy to skin it was determined by using these soap by few volunteer hence it is proved that soap does not give any irritancy to skin . Furthermore the prepared soap were standardized by evaluating various physico chemical properties such as pH appearance odour in which the exhibit satisfactory effect. The soap was free from harsh chemicals which are used in commercial soaps .Herbal soap can be used as a promising alternative to commercial chemical containing skin whitening soaps

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