FORMULATION AND EVALUATION OF HERBAL SOAP OF NEEM

Rushikesh Ram Khedkar, Prof Zine S.R, Dr prachi Udapurka

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. Ayurvedic cosmetics are also known as herbal cosmetics, then the natural content in the herbs does not have any side effect on the human body. Most herbal supplements 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 microorganisms present in the atmosphere may cause chemical infection and damage to skin cosmetics alone are not sufficient. Neem (Azadirachta indica) tree has attracted worldwide prominence owing to its wide range of medicinal properties, neem leaves and its constituents have been demonstrated to exhibit anti-inflammatory, anti-hyperglycemic, anti-ulcer-antimalarial, antifungal, antibacterial, antitumorogenic 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.

INTRODUCTION:

Herbal soap preparation is medicine or drugs sit contain Antibacterial & antifungal agents which are mainly uses of part of plants such as like leaves, stem, roots & fruits to treatment for 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 it sextract exhibit immunomodulatory anti-inflammatory, anti-ulcer-antimalarial, antifungal, antibacterial antioxidant anticarcinogenic property. The present scenario, it seems improbable that herbal soaps, although better in performance and safer than synthetic ones, will be popular with the consumers.
and economic growth. Herbal soap has generated considerable interest and enthusiasm amongst the consumers in recent times, due to eco-friendly nature of the product. There is good scope for setting up herbal soap projects in the country. While there is no particular entry barrier from the point of view of technology, adequate market thrust is necessary to competitively sell the product in the market. The toilet soap consumption in India is estimated at 1200000 to per annum. The soap market is growing at the rate of about 9% per annum.

Reetha is an exceptional cleanser. Hence it’s a perfect substitute for soap and face wash due to the presence of saponin. It is also good for use on sensitive skin. A combination of Reetha and Chickpeas gives a gentle and enriching experience to the skin it has conditioning properties, therefore, it keeps skin moisturized and cool. Reetha prevents the skin from drying and keeps it soft and supple it also helps to treat eczema and psoriasis. Shikakai is quiet effective in treating various skin infections like scabies and also used as a antiwrinkles property

In this review article herbal soap containing neem, tulsi, shikakai and reetha as natural plant ingredients and this content gives or shows antibacterial antifungal & anti-inflammatory activity. In this soap, neem is main compound, and shows medicinal properties. Neem leaf and its extract exhibit immunomodulatory anti-inflammatory, antiulcer antimalarial, antifungal antibacterial antioxidant anticarcinogenic property. Tulsi has got the greatest medicinal value, tulsi to be effective for diabetis they reducing blood glucose level tulsi also used in severe acute respiratory syndrome. Juice of its leaves gives relief in cold fever bronchitis and cough. Tulsi reduce stress, enhance stamina relief inflammation and also shows antifungal activity so tulsi is also used as main compound in this herbal soap. The main antifungal activity of Tulsi serves to be beneficial in soap formulation.

The skin is deeply cleaned, acne is treated, and the skin tone is lightened, among other things. Acute respiratory syndrome was another term used by neem. Tulshi is also utilised by diabetic individuals to lower blood sugar levels. Colds, flu, bronchitis, and coughs are all alleviated by tulshi leaf juice. Neem provides additional benefits by lowering stress and boosting stamina. It is also utilised as a primary ingredient. For moisturised skin, rose water is utilised in the manufacture of soap. This soap primarily provides antibacterial, antifungal, skin-lightening, acne-removal, and smoothing or moisturising properties. The skin is deeply cleaned, acne is treated, and the skin tone is lightened, among other things. Acute respiratory syndrome was another term used by tulshi. Tulshi is also utilised by diabetic individuals to lower blood sugar levels. Colds, flu, bronchitis, and coughs are all alleviated by tulshi leaf juice. Tulshi provides additional benefits by lowering stress and boosting stamina.

Alovera is used as a moisturiser, to prevent signs of ageing, to lessen stretch marks, to lessen acne, to help lighten blemishes, and to minimise acne. Alovera also provides skin that is smooth and supple. For moisturised skin, rose water is utilised in the manufacture of soap. This soap primarily provides antibacterial, antifungal, skin-lightening, acne-removal, and smoothing or moisturising properties. Treat acne antibacterial properties of neem fight acne causing bacteria which help in the treatment and prevention of acne. Tackles blacheads and whiteheads. Alovera shows moisturiser it is moisture the skin whithout giving it a greasy feel. Sit is perfect for anyone with an oily skin. It also fight sunburn or acne. This soap is mainly used all skin problem.

The neem soap is used as an antiseptic soap so there is the antiseptic action to be provided when there is the neem gives an antimicrobial action.
LITERATUREREVIEW:

1. Ashlesha Ghanwat*, Sachin Wayzod and Vanjire Divya (in year 2020) The plant Azadirictaindia, Ocimumtenuiflorum, Sapindusmukorossi and Acacia concinnare were extracted using water and subjected to various evaluation tests according to previous research the antimicrobial activity of Neem was studied. The prepared formulation when tested for different tests gave good results. It does not give any irritancy to the skin as determined by using these soap by few volunteers hence it is proved that soap does not give any irritancy to skin. Further the prepared soap was standardized by evaluating various physico chemical properties such as pH appearance odour in which the exhibit satisfactory effect.

2. Satish Kumar Sharma1* 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 healthcare workers. Many of the antiseptics are sanitizers that depend on 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. The present results indicate that the ingredients of T. catappa, C. longa and G. indica extracts and their combinatorial compositions are capable of developing better antiseptic hand-wash against skin pathogens than the commercially available preparations. Therefore, a new way of combating antibiotic drug resistance of pathogenic organisms and healthier living by germ-free aseptic handwash can be found. A significant number of microbial load can be reduced by using natural, economic and safe handwash. This may serve as a reasonable basis for the preparation of herbal handwash. This has opened new avenues in the production of antiseptic handwash replacing the use of chemicals substances.

3. Rakesh K. Sindhu*1, Mansi Chitkara2, Gagandeep Kaur1, Arashmeet Kaur1, Sandeep Arora1 and indica extracts and their combinatorial compositions are capable of developing better antiseptic hand-wash against skin pathogens than the commercially available preparations. Therefore, a new way of combating antibiotic drug resistance of pathogenic organisms and healthier living by germ-free aseptic handwash can be found. A significant number of microbial load can be reduced by using natural, economic and safe handwash. This may serve as a reasonable basis for the preparation of herbal handwash. This has opened new avenues in the production of antiseptic handwash replacing the use of chemicals substances.

4. 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 microorganisms such as E. coli and S. aureus. In addition this formulation was found to be used for daily use and did not cause any skin irritation. The blend of various oils in this soap formulation helped in providing specific activity to the formulation possessing potent medicinal properties (Ameh et al., 2013).

Makwana Ht, Pandya DJ reported “Launaea pinnatifida Cass. A Species of the Controversial Drug Gojihva: Comprehensive Review 2019” in which they stated that Many primary and secondary metabolites, including as carbohydrates, alkaloids, amino acids, glycosides, steroids, and tannin, have been discovered in root powder, according to pharmacognostical research. Only a few phytochemical components, such as Taraxasterol from the leaves and Taraxeryl acetate from the roots, have been identified from L. pinnatifida. Apart from that, triterpenoid saponins were extracted from Methanolic extract of L. pinnatifida seed, as well as recognized chemicals glutenol and...
hopenol B. The ethanol fraction of L. pinnatifida leaves has been shown to have significant hepatoprotective, antibacterial, antifungal, and antioxidant properties.

Triveni S Inganakal reported “Launaea pinnatifida: Controversial Drug: A Review on its Pharmacological and Traditional Uses 2021” in which he state that The plant is a valuable herb that is well-known for its Ayurvedic and traditional uses, which include health advantages for humans. Diuretic, hepatoprotective, jaundice, blood purifier, antioxidant, and many more ailments have all been treated with the herb. The presence of alkaloids, saponin, flavonoids, terpenoids, and tannin was discovered in a preliminary phytochemical research. Triterpenoid saponins, as well as glutenol and hopenol-B, were extracted from a methanolic extract of Launaea pinnatifida and have been shown to have antifungal, antibacterial, antioxidant, hepatoprotective, and antidiabetic properties. Serum markers in alloxan-induced diabetic rats showed substantial variable differences in serum markers when the isolated compound and ethanolic extract of L. Pinnatifida leaves were compared in an experimental model. When compared to controls, antidiabetic activity in streptozotocin-induced mice revealed a significant drop in blood glucose level and a persistence in reducing impact until the end of the trial. Furthermore, standardizing the development of data that supports its traditional claim requires scientific and methodical study of phytoconstituents of plants. This review considers phytochemical composition as well as contemporary research that has discovered benefits for human health; such as anti-inflammatory, antibacterial, antioxidant, antidiabetic, and hepatoprotective properties.

AIM AND OBJECTIVE

Aim: To study the formulation development and evaluation of herbal antibacterial soap of neem (Azadirachta indica)

Objectives: The ultimate aim of this study is to formulate and evaluate the herbal antibacterial soap using extracts of plant having ethnic and dermatological importance in Ayurveda.

To study the evaluative parameters such as:

1) pH
2) Foam retention
3) Foam height
4) Moisture content
5) Cleansing ability
6) Skin irritation
Formulation of herbal soap

To obtain extract of Azadiracta indica, Ocimumtenuiflorum, Sapindusmukorossi and Acacia concinna powder was incorporated into a soap formulated with basic glycerin soap and which contain 1 gm stearic acid, 0.70gm soft paraffin. Weighed 1gm of stearic acid, 0.70gm soft paraffin, 5ml ethanol was taken. Glycerin basic soap was melted first and to it 1gm stearic acid, 0.70gm soft paraffin, 5ml ethanol were added. Extract was incorporated into melted solution with continuous agitation for 30 minutes until molten mixture became homogeneous. The semisolid mixture was poured into a mould and allowed to solidify.

EXPERIMENTAL MATERIAL AND METHODS

Chemicals
These include stearic acid, soft paraffin, ethanol, orange oil.

Collection, identification and processing of plant

The leaves of Azadiracta indica, Ocimumtenuiflorum, and seeds of Sapindusmukorossi and pods of Acacia concinna were collected from different matured plant. The leaves were dried in hot air oven, pulverized and stored in airtight bottles for the studies.

Extraction

The Azadiricta indica, Ocimumtenuiflorum, Sapindusmukorossi and Acacia concinna powder was extracted with water by decoction process. 9 gm of above stated powder was taken in conical flask and extracted with water for four hours with occasional agitation. Then filtered.

Formulation of herbal soap

To obtain extract of Azadiracta indica, Ocimumtenuiflorum, Sapindusmukorossi and Acacia concinna powder was incorporated into a soap formulated with basic glycerin soap and which contain 1 gm stearic acid, 0.70gm soft paraffin. Weighed 1gm of stearic acid, 0.70gm soft paraffin, 5ml ethanol was taken. Glycerin basic soap was melted first and to it 1gm stearic acid, 0.70gm soft paraffin, 5ml ethanol were added. Extract was incorporated into melted solution with continuous agitation for 30 minutes until molten mixture became homogeneous. The semisolid mixture was poured into a mould and allowed to solidify.
Plan Of Work:

1. Literature Review
2. Selection Of Drug Material
3. Study Of Monograph And Chemical Constituents
4. Extraction Of Crude Drugs
5. Preparation Of Cream Base
6. Incorporation Of Essential Oil Into Soap Base
7. Formulation Of Soap
8. Evaluation Test
MATERIALS & METHOD

NEEM
Monograph:

• CommonName–Neem.

• ScientificName-AzadirachataIndica.

• BiologicalSource-Almost all part of plant AzadirachataIndica.

• Family-Meliaceae, the mahogany family

• Kingdom-plant.

Fig: Neem
Neemisan omnipotent tree and a sacred gift of nature. Neem tree is mainly cultivated in the Indian subcontinent. Neem is a member of the mahogany family, Meliaceae. Today it is known by the botanical name Azadirachta indica (A. indica)

Sarva Roga Nivarini—the curer of all ailments! Role of Azadirachta Indica is a wonder drug as stressed as far back as 4500 years ago.

**Importance of NEEM :-**

- Some of its health-restoring benefits: Effective in skin infection, rashes & pimples.
- Immunity booster, Antiobesity, Blood purifier for beautiful & healthy skin, Antidiabetic, 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.
- Leaf extract accelerates wound healing through an increased inflammatory response and the formation of new blood vessels.

**Constituents:-**

a) Flavonoids,
b) Alkaloids,
c) Azadirone,
d) Nimbin,
e) Nimbidin,
f) Terpenoids
g) Steroids,
h) Margosic acid,
i) Vanillic acid,
j) Glycosides,
k) B-sitosterol,
l) Nimbeclin,
m) Kaempferol,

are present in Neem
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 environmental damage.
- 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.

**Chemicals: Glycerine**
- Glycerine is a non-toxic, 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 to protect it from damage caused by dryness.
- It can increase skin hydration, relievedryness, 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 glycerine soap.
- Ethanol has the ability to dissolve on a partial level in water and oil.
I help in making soap transparent.

Ethanol can be used as an Antiseptic, Antidote and a Medicinal solvent.

Steric Acid:-

- Stearic Acid helps to harden products, such as candles and soap bars.
- It is 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 several other cosmetics such as shaving creams and shampoos.

Sodium lauryl sulphate:-

- Sodium lauryl sulfate (SLS) is a surfactant.
- 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 smoother application.
- It makes soap foamier.

FORMULATION:

Table 1

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAOH</td>
<td>0.8gm</td>
<td>1.6gm</td>
<td>3gm</td>
<td>Saponify oils</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>9.3ml</td>
<td>18.7ml</td>
<td>15ml</td>
<td>Penetration enhancer</td>
</tr>
<tr>
<td>Glycerine</td>
<td>3.1ml</td>
<td>6.25ml</td>
<td>8ml</td>
<td>Humectant</td>
</tr>
<tr>
<td>Ethanol</td>
<td>9.5ml</td>
<td>19ml</td>
<td>12ml</td>
<td>Solvent</td>
</tr>
<tr>
<td>Sodium laurylsulphate</td>
<td>7.5gm</td>
<td>15gm</td>
<td>10gm</td>
<td>Surfactant</td>
</tr>
</tbody>
</table>

Formulation of Soap:-

Table 2

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>Uses</th>
</tr>
</thead>
</table>

### Table 3

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neem</td>
<td>Plant</td>
</tr>
</tbody>
</table>

## PROCEDURE:-

### Extraction:-

- The Azadirichtaindica powder, was extracted with water by decoction process.
- 9 gm of above stated powder of neem were taken in separate conical flask and extracted with water for 40-60 min with occasional agitation.
- Then filtered.

![Extraction of Neem](image)

### Preparation of lye:-

- Lye solution was prepared by mixing 0.8 g NaOH and 1.5 ml DI H2O in 125 ml beaker.
- Measure 9.3 ml Propylene glycol, 3.2 ml Vegetable glycerine.
Add 9.5 ml 95% ethanol solution, 7.5 g sodium lauryl sulfate into 250 ml beaker on hot plate with stir bar.

Heat mixture to 60°C.

Preparation of Soap:

- 6.5 g 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 extract was mixed to the above mixture and volume made up to 100 ml by adding remaining distilled water.
- Let solutions sit for 1 hour at 68°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 mold, let cool and harden.

EVALUATION OF HERBAL SOAP:

The herbal soap formulated was evaluated for the following:

1. Physical evaluation:
2. pH:
3. Foam retention:
4. Foam height:
5. Moisture content:
6. Cleansing ability:

Skin irritation test:

1) Physical evaluation:

Physical characteristics such as color and appearance were checked by naked eye. Odor was identified by smelling.

1. Colour: Green
2. Odour-pleasant 3. Appearance-Good

2) pH
The pH was determined by using pH paper. The pH was found to be basic in nature.

1. Foam retention:
Foaming ability and foam stability: Cylinder shake method was used to test for the foaming ability. 50 ml of the 1% formulated products solution was placed into a 250 ml graduated cylinder, covered with one hand and shaken for 10 times. After 1 min of shaking, the total volume of the foam content was recorded. Foam stability was valued by recording the foam volume after 1 min and 4 min of shake test.

2. Foam height:
0.5 g of sample of soap was dispersed in 5 ml distilled water. Then, transferred it into 10 ml measuring cylinder. Five-eight strokes were given and allowed to stand still and the foam height above the aqueous volume was measured.
3. Moisture content

Themoisture content was used to estimate the percentage of water in the soap by drying the soap to a constant weight. The soap was weighed and recorded as —wet weight of sample—and was dried from 100 to 115°C using a dryer [21]. The sample was cooled and weighed to find the—dry weight of sample.—Themoisture content was determined using the formula.

\[
\% \text{Moisture content} = \frac{\text{Initial weight} - \text{Final weight}}{\text{Final weight}} \times 100
\]

4. Cleansing ability:

A dirty cloth was soaked in a bucket containing soap solution and rinsed slowly and the dirt removed from the cloth was observed.

5. Skin Irritation Test

Soap was applied on the skin of hands and legs of 5 volunteers and observed.

6. Physical Ability:-
When soap is placed in a hot temperature for more than 10-15 minutes, it enters into a gel phase and the color becomes

RESULT AND DISCUSSION:

Among all the formulations, the formulation f2 in both table 1 and 2 exhibited good results. 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: -2.5 Foam Retention was found to be: -5 min Moisture Content in soap is: -6.66%

Discussion:

The present work is concerned with the formulation of soap using extract of neem. The formulated soap was a dry, stable solid showing no color change and good appearance and is foamy in nature. It showed good skin compatibility and causes no irritation when tested on 5 volunteers.

CONCLUSION:

The formulated soap showed considerable antibacterial activity as the commercial standard and all the other parameters were good. The plant Neem were extracted using water and subjected to various evaluation tests according to previous research the antimicrobial activity of Neem was studied. The prepared formulation when tested for different tests 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.
ed by evaluating various physicochemical 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.

The following are the conclusions drawn for the performed thesis:

- Herbal soap containing natural ingredients was successfully formulated by using three different formulations (F1 - F3).
- Among all the three formulations, F2 formulations exhibited good results.
- F2 soap containing natural ingredients was found to be in compliance with all the evaluation tests.

REFERENCES:

11. Shivanand, P., Nilam, M., & Viral, D. (2010). Herbs play an important role in


