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FORMULATION AND DEVELOPMENT OF HERBAL SOAP

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Keywords:

Herbal soap, herbs and oils, eco-friendly, cosmetic value

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ABSTRACT

Herbal soap is a natural product prepared by using plant-based ingredients with medicinal and cosmetic benefits. The present project focuses on the formulation and development of herbal soap using natural herbs and oils such as neem, tulsi, reetha, gilloy, coconut oil, and essential oils. Herbal soaps are widely used because they are safer for the skin, eco-friendly, and free from harmful synthetic chemicals. The main objective of this project is to prepare an effective herbal soap with good cleansing, moisturizing, antimicrobial, and skin-protective properties. The soap was prepared by the saponification process using suitable oils and sodium hydroxide. Various herbal extracts were added to improve the therapeutic and cosmetic value of the product. The prepared soap was evaluated for different parameters such as color, odor, pH, foam height, moisture content, skin irritation, and stability. The results showed that the formulated herbal soap possessed good cleansing action, adequate foam production, pleasant appearance, and no harmful effect on the skin. The herbal ingredients provided antimicrobial and moisturizing properties, making the soap suitable for regular use. This study concludes that herbal soap can be successfully formulated using natural ingredients and may serve as a safe and effective alternative to commercial chemical soaps.

INTRODUCTION:

Plant, which have one or more of its parts having substance that can be used for treatment of disease, are called medicinal plant. Medicinal component derived from plants are widely famous due to their safety, easy availability and low cost. Herbal medicines may include whole parts of plant or mostly prepared from leaves, root, bark, seed and flower of plant. They are administered oraly inhaled or directly applied in the skin. medicinal herbs are more significant to the health. The medicinalvalue of these plant lies in bioactivephytochemical constituents that produce definite physiochemical action on the human body. Some of the most important bioactive phyto chemical constituents are alkaloids, essential oil, flavonoids, tannins, terpenoid, saponins, phenolic compound and many more. These civilization and is natural compound formed the foundation of modern prescription drug as we know today. Herbal soap preparation is a medicine it contain antibacterial, anti-ageing anti -oxidant, anti-septic properties which mainly uses of part of plant like seeds, rhizomes, nuts and pulps to treatment for an injury or disease or to achieve health. Herbal soap do not contain the artificial colours, flavours, fluorides etc., when compared to the content of commercial soap. Herbs are the natural products mostly found in the treatment of almost all diseases and skin problems owing to their high medicinal value, cost effective ness, availability and compatibility Herbal soap preparation is a medicine or drug. it contain antimicrobial or anti oxidation property, agent Which are mainly use of part of plant such as like leave, stem, roots and fruits To treatment for a skin disease or to achieve To good health. A soap manufactory was uncovered in the ruins at Pompeii, and the Greek physician Mr. Galen wrote about soap in the second century. It's hard to believe that as recent as the last century, soap had to be labeled as to it's use. Also during this time, soap fell out of popularity as some modest Victorians believed "soap baths" as disgraceful and sinful.Some of the famous brand name soaps that you buy today are actually not soap at all Nowhere on the packages does the word "soap" appear, rather the products are labeled beauty bars" or "deodorant bars". They are synthetic detergents. These "beauty bars" also contain chemical components called "builders" that increase the efficiency of the soap.higher safety.

So, the present work focuses on the preparation of medicated herbal soap corporating different herbs active potential making anti oxidant antibacterial active soap which canbe used as a regular bathing soap.

ANATOMY

Anatomy of Skin:-

As the body's largest organ, skin protects against germs, regul-ates body temperature and enables touch (tactile) sensations. The skin's main layers include the epidermis, dermis and hypodermis and is prone to many problems, including skin cancer, acne, wrinkles and rashes. The skin is the body's largest organ, made of water, protein, fats and minerals. Your skin protects your body from germs and regulates body temperature. Nerves in the skin help you feel sensations like hot and cold. The skin is the largest organ in the body, covering its entire external surface. The skin has 3 layers-the epidermis, dermis, and hypodermis, which have different anatomical structures and functions (see Image. Cross Section, Layers of the Skin). The skin's structure comprises an intricate network that serves as the body's initial

barrier against pathogens, ultra violet (UV) light, chemicals, and mechanical injury. This organ also regulates temperature and the amount of water released into the environment.

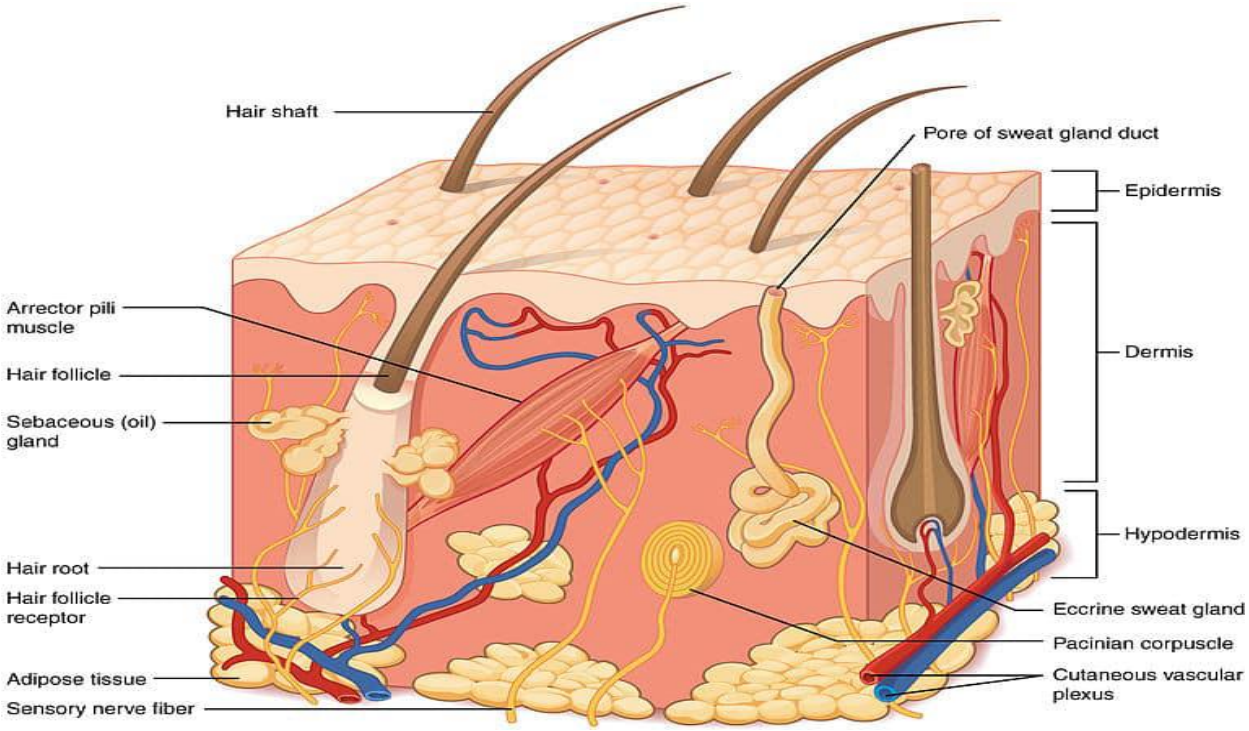

Fig: Anatomy of skin

A) Epidermis: The epidermis is the most superficial layer of the skin and is composed of stratified keratinized squamous epithelium, the thickness of which varies in different parts of the body. It is thickest on the palms and soles of the feet. There are no blood vessels or nerve endings in the epidermis, but its deeper layers are bathed by interstitial fluid from the dermis, which provides oxygen and nutrients and drains as lymph.

(B) Dermis: The dermis is stiff and elastic. It is formed from connective tissue and the matrix contains collagen fibres interwoven with elastic fibers. Rupture of elastic fibers occurs when the skin is stretched, resulting in permanent stretch marks or stretch marks that can appear in pregnancy and obesity. Collagen fibers bind water and give the skin its tensile strength, but as this ability declines with age, wrinkles appear. Its deepest layer are areolar tissue and varying amounts of adipose (adipose) tissue.

(C) Subcutaneous Gland: These consist of secretory epithelial cells originating from the same tissue as hair follicles. They secrete an oily substance, sebum, into the hair follicles and are present in the skin of all parts of the body except the palms and soles of the feet.

They are most numerous in the skin of the scalp, face, axilla and groin. Inareas of transition from one type of surface epithelium to another, such as the lips, eyelids, nipples, labia, and glans penis, there are sebaceous glands that are independent of hair follicles and secrete sebum directly to the surface.

Function of skin:- Skin plays numerous vital roles in the physiology of the body:

Sensation: For the detection of stimuli of temperature, touch, pressure, and pain there are numerous receptors and nerve endings present on the skin.

Protection: The skin acts as a physical barrier which helps in protecting the deep seated organs and tissues from microbial invasion, dehydration, UV radiation, and physical absorption.

Thermoregulation: An increase in body temperature results in sweating and when this sweat gets evaporated from the skin surface, it cools the body (lowers the body temperature) On the other hand, in case of decreased body temperature sweat production gets reduced which helps in the conservation of heat in the body.

Immunity: It provides immunologic information obtained during antigen processing to the appropriate effect or cells in the lymphatic tissues.

Excretion: The sweat released from skin excretes out the toxic substances, ions and several other compounds.

Blood Reservoir: The dermis is highly vascularised. In resting stage, the blood vessels in the skin of an adult carry about 8-10% of the total blood volume. At the time of vigorous activity, the rate of blood flow increases, thus leading to dissipation of extra body heat.

Drug Delivery Route: Skin acts a route for delivery of drugs (transdermalpatches). The transdermal drug delivery system involves the absorption of drug through systemic circulation by transdermal patches. The lipid soluble drugs and substances with low molecular weight easily permeate throughth skin,e.g.,nitroglycerin, hormones, scopolamine, nicotine, etc.

Endocrine Function: Skin helps in biosynthesis of Vitamin D. Ultraviolet light is essential for the first stage of Vitamin D formation

LITERATURE SURVEY:-

1.H.e Srhbiavlacnoasnmde, tiPc., aNlsoilakmno, wMn., a&s "Vnaitruarla, lDc.oestmaelt.i (c2s0"1.0W). ith the beginning of the civilization, mankind had the magnetic dip towards impressing others with their looks. At the time, there were no fancy fairness creams or any cosmetic surgeries.1Theonly

thing they had was the knowledge of nature, compiled in the ayurveda. With the science of ayurveda, several herbs and floras were used to make ayurvedic cosmetics that really worked. Ayurvedic cosmetics not only beautified the skin but acted as the shield against any kind of external affects for the body.

2 Ayurvedic cosmetics also known as the herbal cosmetics have the same estimable assets in the modern era as well. There is a wide gamut of the herbal cosmetics that are manufactured and commonly used for daily purposes.

2. Amit J. Subodh D Alka G. Pushpendra J & Vivek T. Al Herbal cosmetics also known as natural cosmetics with the beginning other civilization, mankind had the magnetic dip towards impressing others with their looks. At the time, there were no fancy fairness creams or any cosmetic surgeries. The only thing they had was the knowledge of nature, compiled in the ayurveda. With the science of ayurveda, several herbs and floras were used to make ayurvedic cosmetics that really worked. Ayurvedic cosmetics not only beautified the skin but acted as the shield against any kind of external affects for the body. Ayurvedic cosmetics also known as the herbal cosmetics have the same estimable assets in the modern era as well. There is a wide gamut of the herbal cosmetics that are manufactured and commonly used for daily purposes.

3. Niharika A Aquiicino J m And A et al (2010) Neem is an attractive broad environment tree can grow upto.30.mtal.and 2.5m in girth. Its trunk usually straight is 30-80 cm in diameter. Its spreading branches form a rounded crown of deep-green leaves and honey-scented flowers as much as 20m across. Neem is native of India, Pakistan, Thailand, and Burma. Its actual origin is still debatable, but it is for sure that it originated in the Indian subcontinent and from there it spread to different parts of the world. The Neem leaves were macerated in 400 ml ethanol and covered with parafilm. It was allowed to stand in room temperature for 48 hours then it was filtered. To get 100% extract, an amount of the extract was placed in an evaporating dish to be subjected to water bath.

4.Kareru, P. G., Keriko, J. M., Kenji, G. M., Thiong'o, G. T.et al.(2010) In this study, Tithonia diversifolia Helms. (A Gray), Aloe secundiflora (Miller) and Azadirachta indica (A. Juss) plant extracts were used to make herbal soaps while The vetiaperuviana (Schum) seed oil was used to make a herbal lotion for skincare. The soaps were tested for the growth inhibition of Escherichia coli, and Candida albicans. The lotion was evaluated against Staphylococcus aureus and E.coli. Although Tithonia diversifolia soap exhibited the highest inhibitory effect on the test bacterial strains, it had the least inhibition against C. albicans. Results from this study indicated that the 'Tithonia diversifolia' soap would have superior skin protection against the tested bacteria but would offer the least skin protection against C. albicans. The herbal lotion inhibited S. aureus and E. coli in a concentration dependent manner, however, the inhibitory effect was more pronounced on S. aureus.

5. Bandyopadhyay, U., Biswas, K.,SengupK.et al. (2004). We have shown earlier that Neem (Azadirachta indica) bark aqueous extract has potent antisecretory and antiulcer effects in animal models and has no significant adverseeffect (Bandyopadhyay et al., Life Sciences, 71, 2845-2865, 2002). The objective of the present study was to investigate whether Neem bark extract had similar antisecretory and antiulcer effects in human subjects. For this purpose, a group of patients suffering from acid-related problems and gastroduodenal ulcers were orally treated with the aqueous extract of Neem bark. The lyophilized powder of the extract when administered for 10 days at the dose of 30 mg twice daily caused a significant ($p < 0.002$) decrease (77%) in gastric acid secretion. The volume of gastric secretion and its pepsin activity were also inhibited by 63% and 50%, respectively.

6.Sharma, J., Gairola, S., Sharma, Y. P., & Gaur, R. D.et al. (2014 Tharu community is the largest primitive indigenous community of the Uttarakhand, India. In this article we have scientifically enumerated medicinal plants and herbal preparations used by the Tharu community to treat various skin diseases, and discussed dermatological properties of these plants in the light of previous ethno medicinal, microbiological, pharmacological, toxicological, phytochemical and
clinical studies.

7.HeyamAli,NaglaaG.Ahmed,RasoolBazighaKadhim,RanaSamour.F.et al.(2011) Nasocomial infection has emerged as a critical issue in hospital care outcome, resulting in substantial morbidity and mortality. The hands of health care workers are the primary routes of transmission of infection to patients. Hence, it brings up the use of antiseptic for hand washing purposes. Many of the antiseptic available in market are alcohol based sanitizers which have

some shortcomings or adverse effects. Their frequent use can lead to skin irritation. Chamomile is one of the most widely used and well- documented medicinal plants in the world.

8.Turmeric – Wikipedia; 2020. Available:https://en.wikipedia.org/wiki/Turmeric rhizomes are used fresh or boiled in water and dried, after which they are ground in to a deep orange-yellow powder commonly used as a coloring and flavoring agent in many Asiancuisines, especially for curries,as well as for the dyeing characteristics imparted by the principal turmeric constituent, curcumin.[6] Turmeric powder has a warm, bitter, blackpepper-like flavor and earthy, mustard like aroma

9.Mahat Tk Sherma K study of medical herbs and its anti bacterial active The benefits medicinal effects of plant materials typically result from the secondary products present in the plant although, it is usually not attributed to a single compound but a combination of the metabolites. The medicinal actions of plants are unique to a particular plant species or group, consistent with the concept that the combination of secondary products in a particular plant is taxonomically distinct. The screening of plants usually involves several approach; ethno botanical approach is one of the common methods that are employed in choosing the plant for pharmacological study. In the present review paper, antimicrobial properties of various medicinal plants were reviewed. The present review deals with the antibacterial activity of various medicinal plants.

EXPERIMENTAL MATERIAL &METHOD:-

Collection of plant material

The seeds of Solanum lycopersicum and Sapindus mukorossi, pods of Acacia nilotica, Peels of Citrus limon, Leaf of Aloe barbadensis and Piper betle, and rhizomes of Curcuma longa were collected from different matured plants, shaded dried, pulverized and stored in air tight bottles for study. Coconut oil was purchased from local market.

Processing of plant material

Extraction of spinous orrasi Acacianilotica, Piperbetle and Curcumalonga powder was done by decoction method taking water as a solvent. In a conical flask 10 gm of each powder was added. For 24h,it was extracted with occasional stirring and extract was collected using rotary evaporator. The latex of Aloe barbadensis was scarpped with the help of a spatula; the latex obtained was grinded using mixer grinder and juice obtained after grinding was kept in the water bath until bubbles in the juice disappear and stored in refrigerator for further use.

Extraction of Citrus

lemon oil was done using Clevenger apparatus i.e. by hydro-distillation method and oil obtained was stored for further use. Extraction of oil from Solanumlycopersicum seeds was done by successive solvent extraction taking water as a solvent. The oil obtained was separated using a separating funnel, collected and stored for further use.

Contents of the Soap

1. Neem
2. Reetha
3. Tulsi
4. Shikakai
5. Gilloy

Botanical name: Azadiracta indica

Part typically used: Leaves

Colour: Green

Description:- Compound alternate, rachis 15-25cm long, 0.1cm thick, leaflet with oblique, serrate, 7-8.5 cm long and 1-1.7 cm wide slightly yellowish green in color.

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

Uses :-

It show antibacterial activity

It act as antifungal activity

It help with lowering inflammation

2. Ritha

Biological name:- Sapindus mukorossi

Part Typical used:- Seeds

Colour:- Brown

Uses:- Detergent , Surfactant

Description:-The fruit is a small leathery skinned drup1to2 cm in diameter, yellow ripening

blackish , containing 1 to 3 seeds

Uses ;- Skin wound healing may be the result of the anti-bacterial, anti-inflammatory and

antioxidant activity.

The vitamin E present in the oil may provide antioxidant benefit.

Reetha seed oil may have the potential for skin wound healing in humans.

3. Tulsi

Biological name :- Ocimumtenui florum

Common name:-Holy basil

Chemical Constituents:-eugenol , germacrene , terpenes

Part Typical used:-Leaves

Colour:- Green

Uses:-

It ideal for treating skin problems such as acne and skin irritation.

Itshydratingandmoisturizingpropertieshelpt okeeptheskinlookingand feeling soft, supple, and nourished.

4.Shikakai

Biological name:- Acacia concinna

Commonname:- shikekai

Chemical Constituents:- Spinasterone, Acacic acid

Part Typical used:-Fruits pods

Colour:-Brown

Uses:-Antidandruff detergent.

Gilloy

Botanical name: Tinospora cordifolia

Common name: giloy

Chemical constituent: Tinosporacordifoliac ontains diverse phytochemicals, including alkaloids, phytosterols, glycosides, tinosporide and various other phytochemicals

Uses:-

It can prevent oxidative stress and that in turn slows down the ageing of the skin. Giloy can also improve blood circulation which best as a natural glow to the skin

Observation Table:-

Table no 1: Chemicals & their source.

Chemicals.	**Source**
Ethanol	Laboratory reagent
Stearic acid	Laboratory reagent
Soft paraffin	Laboratory reagent
Orange oil	Laboratory reagent
Glycerine	Laboratory reagent

Table no 2: Herbal Plant & their source

Herbal plant	**Source**
Neem	Plant
Shikekai Plant	Plant
Reetha Plant	Plant
Tulsi Plant	Plant
Giloy Plant	Plant

The formula shown in Table 3 is best suited for the preparation of

Sr. No.	Ingredients	Quantity (%)	Use
1	Stearic Acid	1gm	Hardening
2	Soft Paraffin	0.70	Hardening
3	Ethanol	5ml	Solvent
4	Neem Powder	4gm	Antibacterial
5	Reetha	3gm	Surfactant
6	Shikekai	2gm	Cleanser
7	Tulsi	1gm	Antiviral
8	Orange Oil	1gm	Perfume

PROCEDURE FOR HERBAL SOAP:-

1. Adding Soap Base Ingredients
2. Coconut Oil 100gm
3. Heat Oil For 5 min (Water bath)
4. Add NaOH Solution to Oil (20gm NaOH + 100gm Water) Stir Continuously for 8-10min .
5. Add SLS Solution of 10ml stir For 2min Continuously
6. Add 10ml Glycerine Stir 2-3min Continuously
7. Adding Herbal Drugs
8. Neem Powder (4gm) Continuous Stirring
9. Add 1gm Tulsi Powder
10. Add Mixture of Giloy (1gm) , Shikekai (2gm) & Ritha (3gm)
11. add stearic Acid (1gm) For Hardening
12. Add 5ml Ethanol as a Solvent
13. Add Soft Paraffin 0.7gm Continuous stirr for 5-8 min
14. Add Rose Water / Orange Oil (q.s) As a Perfume
15. Solution With Continuous Agitation For 30minutes until molten mixture became homogeneous .

The Semi - solid mixture was poured into a mould and allowed to solidify .

EVALUATION:-

The herbal soap formulated was evaluated for the following:

1.Organoleptic evaluation:-

i. Colour :-brown

ii. Odour :-orange

iii. Appearance :-Good

2.Physical evaluation [2, 4]

The herbal soap formulated was evaluated for the following properties:

a) pH :- the pH was determined by using pH paper .the pH was found to be basic in nature

b) Foam retention:- 25 ml of the one percent soap solution was taken into a 100 ml graduated measuring cylinder the cylinder was covered with hand and shaken10 times the volume of foam at 1 minutes interval for 4 minutes was recorded . it was found to be 5 minutes .

c) Antimicrobial test :- there was various study conducted on antimicrobial activity of neem and hence according to research paper by antimicrobial activity of Azadiricta indica leaf, bark and seed extract.

% free Alkali content

The beaker containing 10g of dried soap was then filled with 150 ml of distilled water. To dissolve the soap, it was heated for 30 to 40 min at reflux on a water bath. This solution was cooled, transferred with the washings to the 250 ml conical flask, and the capacity was filled with distilled water. Two drops of the phenolphthalein indicator were added to 10 ml of the soap solution in the titration flask. The solution was then titrated against 0.1M HCl until it turned colorless.

Moisture content

A sample of soap weighing 10g was weighed right away and noted as "wet weight of the sample." Using the appropriate drying equipment, this wet sample was dried to a constant weight at a temperature not to exceed 115 °C. After cooling, the sample was weighed once more to determine its "dry weight." The following equation was used to calculate the sample's moisture content.

%Weight=A-B/B×100 Where;

%Weight = % of moisture in sample,

A = weight of wet sample (gm),

B = weight of dry sample (gm).

Alcohol insoluble matter

50 ml of warm ethanol was introduced to a conical flask containing a 5 gm sample of soap in order to dissolve it. Using tarred filter paper and 20 ml of warm ethanol, the liquid was filtered and then dried at 1050 C for an hour. The weighted filter paper had dried out

Foam forming ability: For the determination of the Poly herbal soap for its ability to form foam about 1.0 gm of soap was taken and was dissolved in distilled water (about 50ml) in a 100 ml graduated measuring cylinder. It the measuring cylinder was then shaken for about 2- 3 minutes and it was allowed to stand for about 10 min. Foam height was measured after 10 minutes. Record the observation for three consecutive experiment and the mean was taken

Washing Capability: The herbal soap was put through a formulation test, as well as the

simplicity with which it could be washed with water.

Irritancy Test: Irritation of the skin test: The herbal soap composition was subjected to a skin irritancy test. There is no irritancy or redness in the preparation. The condition was observed for a period of 24 hours.

SUMMARY:-

A herbal soap and hand sanitizer was formulated using the leaf and bark extract of

Azadirachta indica, Ocimum tenuiflorum ,Sapindus mukorussi and Acacia concinna powder. Ayurvedic cosmetics are also known as the herbal cosmetics the naturalcontent in the herbs does not have any side effect on the human body[5] 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 [6]. Numerous chemical toxins microorganism present in the atmosphere may cause chemical infection and damage 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

inflammatory, antihyperglycemic, antiulcer [7] 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. Herbal soap ingredients were used reetha, neem, shikekai and tulsi.,in which neem leaf and seed were found effective against some dermatophytes. Shikeki and Reetha acts as a detergent and having cleaning and foaming activity and Tulsi shows antiviral activity

CONCLUSION:-

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 physicochemical properties such as pH appearance odour in which the exhibit satisfactory effect. The Physico-chemical and biological parameters of the prepared soap were studied. The formulation was good in appearance, with pleasant odor and color. The pH was found to be in range which is specified i.e. 7-10. Other parameters Like % free alkali content, Foam ability, Foam stability, moisture content, and alcohol insoluble matter was determined which was signifying the standard values for soap. Biological parameters like Antioxidant and Antibacterial study was conducted,

which indicates the prepared soap to be a potent antioxidant and antibacterial source. Based on the study results, it can be concluded that herbal soap can be formulated using cold process method taking different parameters in consideration as that of skin condition and as that of herbal potentials and its activity. This sought of herbal formulation can bring a big difference in the field of herbal cosmetic as there are many alignment and related flaws in different poly herbal or chemical-based formulations which can be removed.

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