



Preparation And Evaluation Of Herbal Face Soap For Glowing Skin And Dark Spots.

Shrutika Ashok Jagdale Prof. Ms. Kandalkar. P.S.

Nandkumar shinde College of pharmacy Vaijapur Dist: Chh. Sambhajanagar

ABSTRACT

Bacterial skin infection are most common amongst people requiring significant attention for treatment and also for maintaining healthy skin. Some herbal plant extract and their oils were found to have antibacterial activity. The aim and objective of present study are to formulate and evaluate antibacterial polyherbal soap using **Azadirachta indica (neem), Ocimum tenuiflorum (tulsi) oils, curcuma longa (Turmeric) Powder.**

Herbal soap ingredients were used neem, turmeric and tulsi in which neem leaf and seed were found effective against some dermatophytes. Tulsi shows antiviral activity. The antibacterial soap prepared against the organism **E.coli** by cold process method. The prepared formulation were evaluated for various physicochemical parameters for good characteristics were observed. The easy availability of plant and their effectiveness helps manufactures with cost effective benefits and with less or no side effects.

KEY WORDS: Curcuma longa, Azadirachta indica, Ocimum tenuiflorum, Herbal soap, antibacterial soap, herbal extracts, E.coli.

INTRODUCTION

Soap is mixture of sodium salts of various naturally occurring fatty acids. Soap is produced by saponification or basic hydrolysis reaction of fat or oil. The many commercial preparation of soap contains various chemicals which are harmful to the skin. The use of herbal soap is good alternative for such commercial soap.

Herbal soaps are made using natural herbs and ingredients that are healthier and beneficial for the skin and are less likely to cause any damaging effects. The herbs infused in these soaps have therapeutic and healing characteristics that offer specific benefits to the skin, such as nourishment, strength, healing and moisturizing effects. The soap

also contain super fatty oils, vit. E and essential oils.

These soaps also contain glycerine which is generally not used in commercial soap. glycerine helps in retaining the moisture in the skin thereby making these soap for dry skin conditions. herbal soap preparation are medicine or drug which contain antibacterial and antifungal which mainly used parts of plants such as leaves, stem, root and fruits for treatment for an injury or disease or to achieved good health. In the present study, **Azadiachta indica (neem)** and **Ocimum tenuiflorum (tulsi)** oils were used to prepare the antibacterial herbal soap and there physiochemical characteristics were evaluated.

SKIN

The skin or cutaneous membrane covers the external surface of the body. It is the largest organ of the body in surface area and weight. The function of the skin is body temperature regulation, a reservoir for blood, protection from the external environment, cutaneous sensations, excretion and absorption, and vitamin D synthesis.

Skin is the most exposed part of the body to the sunlight, environmental pollution and also to some protection against the pathogens. The most common skin disorders are eczema, warts, acne, rashes, psoriasis, allergy, etc. *Staphylococcus aureus* (*S.aureus*) is a Gram-positive bacterium that can live as a commensal organism on the skin and in the nose and throat. *Aurus* causes Approximately 30% of healthy people are asymptotically colonized by *S. aureus*. a range of infections, from minor skin infections to abscesses, endocarditis, and sepsis. *S. aureus* is also a major cause of food poisoning induced by heat resistant enterotoxin A and is a leading cause of nosocomial infections.

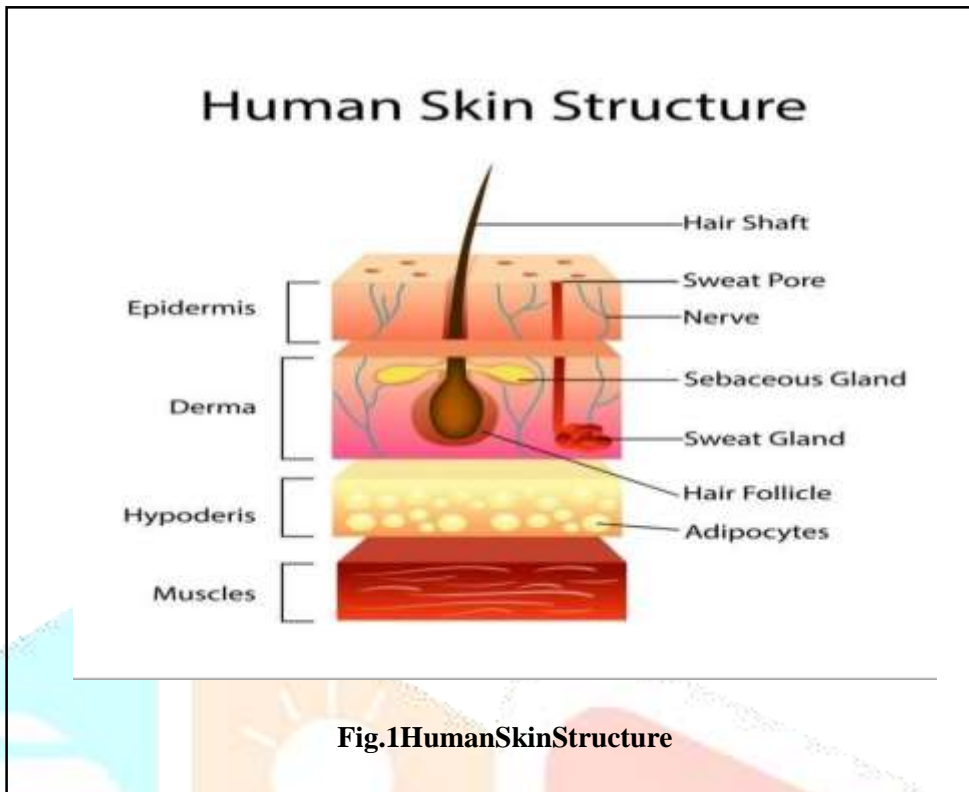


Fig.1 Human Skin Structure

Parameters	Epidermis	Dermis	Subcutaneous
Structure	Superficial part of the skin ; stratified squamous epithelium; Composed off our of five strata	Deep part of the skin; connective tissue composed of two layers	Not part of the skin; loose connective tissue with abundant deposits of adipose tissue
	Prevents water loss and the entry of chemicals and microorganisms; protects against abrasion and	It is responsible for the structural strength and flexibility of the skin; the epidermis exchanges gases, nutrients, and	Attach esthedermisto underlying structures; adipose tissue provides

<p>Function</p>	<p>ultraviolet light produces Vitamin D; gives rise to hair, nails, and glands</p>	<p>waste products with blood vessels in the dermis</p>	<p>energy storage insulation, and padding; blood vessels and nerves from the subcutaneous tissue supply the dermis</p>
------------------------	--	--	--

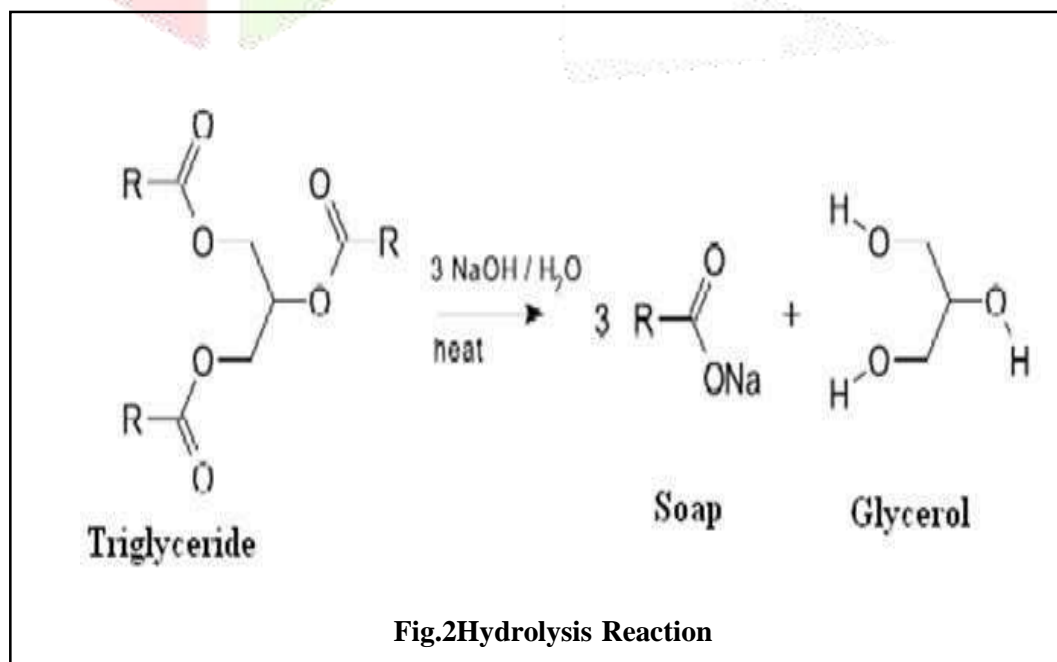
SOAP

Soap is a mixture of sodium salts of various naturally occurring fatty acids.

INTRODUCTION OF SOAP:

Soaps are carboxylate salts with very long hydrocarbon chains. Soaps can be made from the base hydrolysis of a fat or oil. It is used as a surfactant for washing, bathing and cleaning but used in textile spinning for lubricants. Saponification is the process in making the soap by reaction of triglyceride fats are hydrolyzed into free fatty acids then it will combine with alkali to form crude soap.

HYDROLYSIS REACTION:



LITERATURE SURVEY

1) S.AZauro, M.TAbdullahi, A.Aliyu (2016)

The use of locally available raw materials in soap production was carried out. The soap was prepared using shea butter oil (SBO), palm kernel oil (PKO) and plantain peels. The physicochemical parameters of the oils were analysed. The saponification values of the oils $175.30 \pm 0.81 \text{ mgKOH/g}$ (SBO) and $249.18 \pm 1.40 \text{ mgKOH/g}$ (PKO), and the iodine values $65.99 \pm 1.27 \text{ I}_2/100\text{g}$ (SBO) and $18.58 \pm 0.86 \text{ I}_2/100\text{g}$ (PKO) agreed with those found in literature. The free fatty acid (FFA), acid value and Relative density were found to be 1.719 ± 0.009 , $3.60 \pm 0.06 \text{ mgKOH/g}$ and 0.90 ± 0.02 for PKO and for SBO the corresponding values were 5.499 ± 0.113 , $11.78 \pm 0.56 \text{ mgKOH/g}$ and 0.91 ± 0.07 respectively. The alkali was extracted from the plantain peels ash and used to saponify the oils for the production of soap. The soap produced was analysed by testing its hardness, moisture and foaming stability. The results indicated that the soap produced by SBO:PKO (50:50) showed a very good properties, hence regarded better compared to the soap produced by SBO and PKO separately.

2) P. Yudharaj, M.Shankar, R.Sireesha (2016)

A medicinal plant is any plant which, in one or more of its organs, contains substances that can be used for therapeutic purposes, or which are precursors for chemo-pharmaceutical semi-synthesis. When a plant is designated as medicinal, it is implied that the said plant is useful as a drug or therapeutic agent or an active ingredient of a medicinal preparation. Herbal medicines are in great demand in the developed as well as in the developing countries for primary health care because of their wide biological and medicinal activities, higher safety margins and lesser costs.

3) Rakesh K.Sindhu, Mansi Chitkara, Gagandeep Kaur (2019)

The aim of our study was to develop the polyherbal hygienic soap by using cold process method and evaluate antimicrobial potential by agar well diffusion method. Soap was prepared using coconut oil, castor oil, Neem oil, Mentha oil, rose petals extract and NaOH (lye) and the different extracts were incorporated into the basic saponification reaction. The herbal formulation was prepared then evaluation for the analysis of pH, Moisture content, foaming index, foam retention time, saponification, ethanol soluble matter and antimicrobial activity using different concentration of soap solution comparing with standard. The results demonstrated that pH 6.5–7, moisture content 3.5%, foam index was 16.5, foam retention time 10.0 minutes, Saponification value was 161.287 mg/ml, 72% TFM, ethanol soluble matter was 63.80% for herbal soap. Also the evaluation tests showed that the herbal soap has satisfactory antimicrobial results as compared to standard antibiotic. Moreover, oils used are added to treat various skin infections and for daily usage.

4) G.Sucharita,V. Ganesh,SivaKrishna(2020)

Bacterial skin infections are most common amongst people, requiring significant attention for treatment and also to maintain healthy skin some herbal plant extracts have antibacterial activity the aim and objective of the present study is to formulate antibacterial poly herbal bath soap using curcuma longa [Turmeric], azadirachtaindica[Neemoil],theantibacterialalsoappreparedagainsttheorganismE.colibyu sing a cold process method. The prepared formulation were evaluated for various physicochemical parameters for good charecteristics were observed. The easy availability of plant and their effectiveness helps manufactures with cost-effective benefits and with less or no side effects.

5) AshleshaGhanwat,SachinWayzod,VanjireDivya(2020)

A herbal soap was formulated using the leaf and bark extract of Azadirachta indica, Ocimum tenuiflorum , Curcuma longaoil and powder. Ayurvedic cosmetics are also known as the herbal cosmetics the natural content in the herbs does not have any side effect on the human body.

6) Dr.A.Seetha Devi,D.VSivani, D.Anusha (2021)

Bacterial skin infections are most common amongst people requiring significant attention for treatment and also for maintaining healthy skin. Some herbal plant extract and oil swere found to have antibacterial activity.The antibacterial activity of the prepared formulation was tested using the agar well diffusion method against the organism E. coli and S. aureus and they exhibited good anti bacterial effect.

7) Seema U. Shinde, Nikita D. Gidde, Jamir A. Tamboli (2021)

Bacterial skin infections are the most prevalent among individuals, necessitating immediate treatment as well as on going care to preserve healthy skin. Because some herbal plant extracts have antibacterial properties, the goal of this research is to makean antibacterial poly herbal bath soap using curcuma longa [Turmeric].

The developed polyherbal formulation had a good antibacterial activity, and it was analysed for several physicochemical parameters and whether it has good characteristics. Plants are easily obtainable, and their efficacy helps manufacturers in achieving cost-effective outcomes with few or no side effects.

AIM AND OBJECTIVE

AIM:

The ultimate aim of this study is to formulate and evaluate the herbal bath soap using different types of herbs having antibacterial, antiviral and antifungal activity. Then, these herbs were used to make soap by reacting oil and lye in a process of saponification. The soap made was evaluated for physicochemical characters like colour, odour, clarity, pH, alcohol insoluble matter, foam forming ability etc. the antibacterial activity check by using E. coli.

OBJECTIVE:

- Preparation of soap base.
- Formulation of poly herbal soap using various medicinal plants oils.
- Preparation of poly herbal soap by using cold process.
- Standardization of herbal components
- To prevent bacterial skin infection.
- To nourish and beautify the skin.

COLLECTION OF MATERIAL

Neem oil, tulsi oil, aloe vera gel, turmeric powder, mentha oil, honey, coconut oil was purchased from the local market. Sodium Hydroxide, stearic acid, ethanol, propylene glycol, sorbitol, glycerine laboratory reagent.

DRUG AND HERB PROFILE**NEEM****Fig.3Neem****BIOLOGICALNAME:** Azadirachta indica**SYNONYM:** Neem**COMMONNAME:** Neem, neemtree, Indianlilac**PLANTFAMILY:** Meliaceae **ORDER:** Sapindales **GENUS:**Azadirachta **SPECIES:** Azadirachta indica **USES:****Benefits for the skin**

The use of neem oil in general skincare or as a treatment for skin conditions of the available research into medicinal uses of neem concluded that its extracts can help treat a variety of skin conditions, including:

Fighting skin infections

The antibacterial properties of cosmetic products containing neem compounds. The authors found that soaps containing extracts of neem leaf or neem bark prevented the growth of several strains of bacteria.

TURMERIC



Fig.4Turmeric

BIOLOGICALNAME:Curcuma longa **SYNONYMS:**Curcuma domestica

COMMONNAME:Turmericroot, Indiansaffron

PLANTFAMILY:Zingiberaceae **ORDER:**Zingiberaceae **GENUS:**

Curcuma **SPECIES:**Curcuma longa**USES:**

It contains properties that contribute to a natural glow:

Turmeric contains antioxidants and anti-inflammatory components. These characteristics may provide glow and luster to the skin. Turmeric may also revitalize your skin by bringing out its natural glow.

It can heal wounds:

The curcumin found in turmeric can help wounds heal by decreasing inflammation and oxidation. It also lowers the response of your body to cutaneous wounds. This results in your wounds healing more quickly.

It can help your psoriasis:

The antioxidant and anti-inflammatory qualities of turmeric may help your psoriasis by controlling flares and other symptoms.

TULSI



Fig.5Tulsi

BIOLOGICALNAME: Ocimumtenuiflorum

COMMON NAME: Holybasil **CHEMICALCONSTITUENTS:**eugenol, germacrene,terpenes

PARTTYPICALUSED:Leaves

COLOR: Green

USES:

Acne

Tulsi may be beneficial for acnedue to its antibacterial properties.

Healthy skin aging

Antioxidants are an essential part of caring for aging skin, as they reduce free radical production. Free radicals are known to create oxidative stress. This damages skincells, causing fine lines and wrinkles

Pigmentation

Tulsi santi oxidant properties ,it may also helptackle pigmentation.

ALOEVERA



Fig.6Aloe Vera

BIOLOGICAL NAME: Aloe Barbadensis

TAXONOMICAL CLASSIFICATION:

KINGDOM: Plantae - plantus **SUPERDIVISION:**

Spermatophyte **DIVISION:** Angiosperms

CLASS: Monocots

SUB CLASS: Rosidae **ORDER:** Asparagales

FAMILY: Liliaceae **GENUS:** Aloe **SPECIES:**

Barbadensis

USES OF ALOE VERA GEL:

It treats sun burns:

Aloe vera helps with sun burn through its powerful healing activity at the epithelial level of the skin. A layer of cells that cover the body. It acts as a protective layer on the skin and helps replenish its moisture. Because of its nutritional qualities and antioxidant properties, the skin heals faster.

It acts as a moisturizer:

Aloe moisturizes the skin without giving it a greasy feel so it's perfect for anyone with any oily skin complexion.

It treats acne:

Aloe vera gel contains two hormones: Auxin and Gibberellins. These two hormones provide wound healing and anti-inflammatory properties that reduce skin inflammation. Gibberellin in aloe vera acts as a growth hormone

stimulating the growth of new cells. It allows the skin to heal quickly and naturally with minimal scarring.

It lessens the visibility of stretchmarks:

The skin is like one big piece of elastic that expand and contract as needed to accommodate growth. But if the skin stretches too fast, the elasticity of the skin can be damaged. That's what leaves those unsightly stretch marks.

HONEY



Fig.7 Honey

BIOLOGICAL NAME: Apismillifera

SCIENTIFIC CLASSIFICATION:

KINGDOM: Anemalia **PHYLUM:** Euartharopoda **CLASS:**

Insecta

ORDER: Hymenoptera **FAMILY:** Apidaets **USES**

OF HONEY

Moisturizing face mask:

Its moisturizing and soothing effects, raw honey can hydrate the skin, leaving it soft, radiant, and glowing.

Scar fader:

Honey is a great wound healer.

Acnes pot treatment:

Honey in particular works well for this-it is an anti-inflammatory which can help reduce redness and swelling of pimples, says Engelman, and its antibacterial properties can help fight acne-causing bacteria. "Also, because

honey keeps the skin well-hydrated and balanced, it helps control the production of oil."

Cuticle moisturizer:

Honey is a natural humectant, it draws moisture into the skin keeping your cuticles happy and peel free.

COCONUTOIL



Fig.8CoconutOil

BIOLOGICALNAME:Cocosnucifera **KINGDOM:** Plantae

ORDER: Arecales

FAMILY:Areceaceae

SUB-FAMILY:Arecoideae **GENUS:** Cocos L.

SPECIES: Nucifera

USESOF COCONUT OIL:

SkinConditions:

Coconutoilisonariseinpopularityfortreatingskinconditionslikeeczema,psoriasis and otherskin conditions.

StretchMarks:

Usingcoconutoilcanhelpreducethestretchmarksthatareleftbehind, helpingthem fade morequickly while keeping skin moisturized to allow quicker healing.

SunburnRelief:

Coconutoilcanhelpsootheinflamedskin,reducednessandrehydrateskin.Coconut oilcontains a series of fatty acids that nourish and immunize your skin.

MENTHA OIL



Fig.9MenthaOil

BIOLOGICAL NAME: Mentha piperita

KINGDOM: plantae **ORDER:** lamiales

FAMILY: lamiaceae

SUB-FAMILY: nepetoideae **GENUS:** mentha L.

SPECIES: M. piperita **USES OF MENTHA OIL:**

Soothes skin irritation

The soothing and cooling effect of mentha oil make it an excellent oil for itchy and irritated skin.

Reduces acne

It kills acne-causing bacteria and balances sebum production.

SODIUM HYDROXIDE

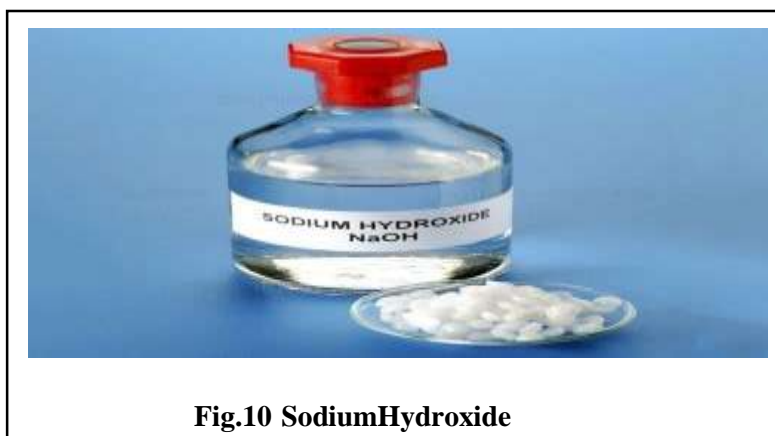


Fig.10 SodiumHydroxide

IUPAC NAME: Sodium hydroxide **OTHER NAMES:** caustic soda, lye, caustic.

CHEMICAL FORMULA: NaOH **MOLECULAR WEIGHT:** 39.997g/mol

APPEARANCE: White, waxy, opaque crystals.

ODOUR: Odourless **MELTING POINT:** 318°C

BOILING POINT: 1,388°C

SOLUBILITY: Soluble in glycerol negligible in ammonia, Insoluble in ether slowly soluble in propylene glycol.

USES OF Multani Mitti :

Skin Conditions:

Multani Mitti Powder is on a rise in popularity for treating skin conditions like eczema, psoriasis and other skin conditions.

Stretch Marks:

Using



Fig.11 Multani Mitti

Multani Mitti Powder can help reduce the stretch marks that are left behind, helping them fade more quickly while keeping skin moisturized to allow quicker healing.

Sunburn Relief: Multani Mitti Powder can help soothe inflamed skin, reduce redness and rehydrate skin.

Multani Mitti Powder contains a series of fatty acids that nourish and immunize your skin.

BIOLOGICAL NAME: Bentonite clay **Synonym:** fullers earth

ORDER: lamiales **FAMILY:** lamiaceae

SUB- FAMILY: nepetoideae

GENUS: mentha L.

Uses:- soften skin ,improve blood circulation,remove dark spots , blemishes etc

USES OF SODIUM HYDROXIDE:

Sodium hydroxide was historically used in the formulation of soaps, but is currently seen in a variety of formulas, including bath products, cleansing products, fragrances, foot powders, hair dyes and colors, makeup, nail products, personal cleanliness products, shampoos, shaving products, depilatories, skin care products. aging and irritation.

STEARIC ACID

IUPAC NAME: octadecanoic acid **OTHER NAMES:** palmitoleic

acid **CHEMICAL FORMULA:** C₁₈H₃₆O₂

MOLECULAR WEIGHT: 284.48g/mol

APPEARANCE: White Solid **ODOUR:** Pungent, oily

MELTING POINT: 69.3 °C

BOILING POINT: 361 °C

SOLUBILITY: Insoluble in water and soluble in ethanol, alkyl acetates, phenyls.

USES OF STEARIC ACID:

When added to soap formulations, Stearic Acid derivatives function as thickeners that help to harden the formulas into solids and that help to eliminate the thin and runny feeling of watered-down soaps.

SODIUM LAURYL SULPHATE

IUPAC NAME: Sodium dodecyl sulphate **OTHER NAMES:** sodium

lauryl sulphate **CHEMICAL FORMULA:** C₁₂H₂₅NaO₄S

MOLECULAR WEIGHT: 288.38g/mol

APPEARANCE: White to pale yellow paste or liquid.

ODOUR: Mild odour **MELTINGPOINT:**205.5°C **BOILING**

POINT: 288.4°C**SOLUBILITY:**

Sodium lauryl sulphate is a surfactant, which means a molecule that has amphiphilic properties. This means the sulphate head group is hydrophilic and water soluble, while the 12-carbon-long chain is hydrophobic and water insoluble.

USES OF SODIUM LAURYL SULPHATE:

SLS is known as a “surfactant.” This means it lowers the surface tension between ingredients, which is why it’s used as a cleansing and foaming agent.

PROPYLENEGLYCOL

IUPACNAME:Propane-1,2-diol

OTHER NAMES:1,2-Propyleneglycol,1,2-dihydroxypropane,2-Hydroxypropanol

CHEMICAL FORMULA:C₃H₈O₂

MOLECULAR WEIGHT: 76.09g/mol

APPEARANCE:Colourless viscous liquid.

ODOUR: Odourless **MELTING POINT:** -60°C

BOILING POINT:187.6°C

SOLUBILITY:Soluble in water, ethanol and acetone. **USES OF PROPYLENEGLYCOL:**

Humectant, solvent, emollient, and preservative.

GLYCERINE

IUPACNAME:Propane-1,2,3-triol **OTHER NAMES:**Glycerol,1,2,3-

propanetriol **CHEMICAL FORMULA:** C₃H₈O₃ **MOLECULAR**

WEIGHT: 92.094 g/mol

APPEARANCE:Colourless viscous liquid. **ODOUR:** Odourless

MELTING POINT:17.8°C

BOILING POINT: 290°C

SOLUBILITY:It is soluble in water, but has limited solubility in most organic solvents such as acetone, chloroform, and diethyl ether.

USES OF PROPYLENE GLYCOL:

Glycerine is used as a humectant in soap products. In other words, glycerine helps to ensure that your skin will maintain its own moisture in order to protect it from damage caused by dryness. Instead of creating a barrier, humectants such as glycerine still allow your skin to breathe.

SOAP BASE FORMULATION

INGREDIENTS	QUANTITY	USES
Sodium hydroxide	8.6gm	Alkali
Coconut Oil	35gm	Saponifying agent
Saturic Acid	15gm	Emulsifier, Hardening
Lye Water	8.6gm	Alkali
Glycerin	8.6gm	Humectants
Ethanol	35gm	Antimicrobial
Propylene Glycol	45gm	Humectants
Sorbitol	50gm	Thickening Agent
Distilled Water	q. s to 100 ml	Vehicle
Mulvane mitt	1 Table Spoon	Absorbent

PROCEDURE

Heat the oil to 102°C

Follow the all safety protocols while handling NaOH, Lyewater.

Add lyewater to the heated oils with continuous stirring until the saponification reaction is complete.

Allow the solution to settle down for 2 minutes.

Heat separately glycerine and propylene glycol and ethanol gently.

Now add ethanol to the mixture of oils and lyewater solution.

Then mix glycerine, propylene glycol thoroughly.

Now add sorbitol to this mixture.

Pour into the molds allow to harden and then remove from mold.

POLYHERBAL SOAP FORMULATION**FORMULA:**

Ingredients	Formulation			Uses
	B1	B2	B3	
Soap Base	100g	100g	100g	Base
Vegetable Glycerin	2.65g	2.65g	2.65g	Moisturizer
Neem oil	2.65g	2.0g	3.3g	Antibacterial agent
Tulsi oil	2g	1g	3g	Antibacterial, Antiviral
Turmeric	0.7g	0.7g	0.7g	Antiseptic
Honey	1.3g	1.3g	1.3g	Humectant
Mentha oil	-	7 drops	7 drops	Perfume
Amaranth	-	0.3ml	0.3ml	Colouring agent

PROCEDURE



Weigh 100g previously prepared glycerine soap base.



Then weigh all other herbal ingredients mentioned in the formula table.



Now gently heat soap base at 45°C.



After complete liquification of base add all the ingredients one after another with gentle stirring maintain temp. at 45°C.



Stir until a uniform solution appears.



Pour this solution into soap mold and form the soap.



Wrap and submit with labelling.



EVALUATIONPARAMETERFORPOLYHERBALSOAP

Physicalparameters:

Clarity and colour was checked by naked eyes against the white background and the odour was smelled.

pH:

A digital pH meter is used to determine the pH of the produced mixtures. The 1g of formulations were diluted in 100 mL of distilled water and kept in the refrigerator for two hours. The pH of the formulation was measured using a pH meter that had previously been calibrated.



Fig.13pHDetection

FoamHeight:

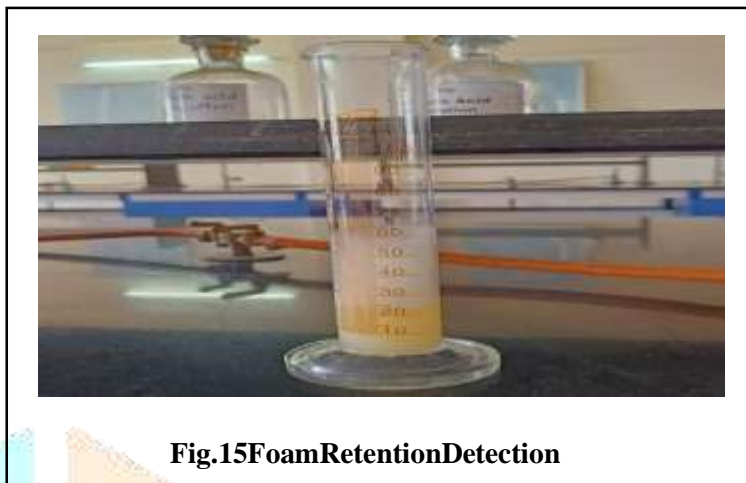
A sample of 0.5g of soap was dispersed in 25 mL of distilled water. Then, it was transferred to a 100ml measuring cylinder, and the volume was increased to 50 ml by adding water. 10 strokes were administered and let to stand until the aqueous volume reached 50 ml, at which point the foam height was measured above the aqueousliquid.



Fig.14 FoamHeightDetection

Foam Retention:

A 100 ml graduated measuring cylinder was filled with 25 ml of the 1% soap solution. Hands were placed over the cylinder and it was shaken 5 - 10 times. For 4 minutes, the volume of foam was measured at 1-minute intervals.



Alcohol Insoluble Matter:

5gm of sample was taken in a conical flask. Added it to 50 ml of warm ethanol and shaken vigorously to dissolve the solution was filtered through a tarred filter paper with 20 ml warm ethanol and dried it at 105 °C for one hour. The weight of dried paper was taken.



Formula:

Alcohol Insoluble Matter = weight of dried filter paper - initial weight of filter paper

Saponification value determination:

The amount of Potassium Hydroxide in milligrams which is required for the complete saponification of fat or oil of 1gm. In either words it is defined as the mean of molecular weight of fatty acid which is present in oil or fat. For the determination of saponification value about 2gm of the soap sample was taken in a conical flask and 0.5M KOH solution was added to it. This mixture was heated to about 55 degree Celsius along with stirring continuously on a hot water bath. Then the temperature was further increased 100 degree Celsius and boiling was continued for about 1 hour Titration was performed with phenolphthalein as an indicator and 0.5M HCl. The end point observed is pink

colour disappearance.

$$\text{Saponification value} = \frac{\text{Avg. Volume of KOH} \times 28.056}{\text{Weight of oil}}$$

Antimicrobial test:

The given sample of the soap was tested for its antimicrobial properties. By cup plate method. The micro-organism used were E. coli. In this method soap solution was prepared by dissolving 1g of soap in distilled water. The plates were then kept for incubation for about 24 hours at a temperature of 37 °C. Calculate the zone of inhibition.



Fig.17 ZoneOfInhibitionByCupPlateMethod

RESULT AND DISCUSSION

The polyherbal soap results of various evaluation parameters are shown in the table. The formulations exhibited good appearance characteristic. The table depicts that the pH of the herbal formation was 6.5-7 which was optimum for its utilization on the skin. Higher as well as lower skin pH refers to the harmful effects on the skin. The foam retention time was found to be 4 minutes and the foam height was found to be 3cm. This means the lather producing ability of the soap was satisfactory and stable. The antimicrobial testing was successfully performed as shown in the table with successful inhibition of the micro-organism E. coli.

Sr. No	EvaluationParameters	Readings			Standard
		B1	B2	B3	
1	PH	7.57	7.62	8.7	6.5-7.5
2	Foamheight	3cm	3.5cm	4cm	2.5 -3.0 cm
3	FoamRetention	0.5	3.0	3.5	0.5 – 2.5
4	Alcoholinsoluble matters	10g	20g	25g	18g
5	Saponificationvalue	0.22	0.20	0.30	0.25
6	Antimicrobialtest	20mm	10mm	35mm	-

CONCLUSION

The evaluation parameters carried for standardizing the herbal soap by colour determination, pH, alcohol insoluble content, Saponification value were carried out. This led to an outcome of the formulation of stable polyherbal soap possessing potent antimicrobial activity against micro-organisms such as E. coli. In addition this formulation was found to be used for daily use and did not cause any skin irritation. The blends of various oils in this soap formulation helped in providing specific activity to the formulation possessing potent medicinal properties.

Based on the study research it can be concluded that poly herbal can be effectively formulated as in the form of soap by using cold process technique which having excellent antibacterial activity.

REFERENCES

- 1]. S. A. Zauro, M. T. Abdullahi, A. Aliyu, A. Muhammad, I. Abubakar, Y. M. Sani, Production and Analysis of Soap using Locally Available Raw-Materials, Elixir International Journal Applied Chemistry, 96 (2016) 41479-41483.
- 2]. P. Yudharaj, M. Shankar, R. Sireesha, E. Ashok Naik, R. Jasmine Priyadaeshini, Importance and uses of medicinal plants – an overview International Journal of Preclinical & Pharmaceutical Research, 2016; 7(2): 67-73.
- 3]. Rakesh K. Sindhu, Mansi Chitkara, Gagandeep Kaur, Arashmeet Kaur, Sandeep Arora, I. S. Sandhu, Formulation development and antimicrobial evaluation of polyherbal soap, Plant Archives Vol. 19,

- 4]. G. Sucharita, V. Ganesh, Siva Krishna, D. Sireesha, S.Pawankumar, Formulation and evaluation of polyherbal antibacterial soap, International Journal of Engineering Science and Computing, Volume 10 issue no. 8, 2020.
- 5]. Ashlesha Ghanwat, Sachin Wayzod, Vanjire Divya, Formulation and Evaluation of Herbal Soap, Current Trends in Pharmacy and Pharmaceutical Chemistry, 2020.
- 6]. Dr. A. Seetha Devi, D.V Sivani, D. Anusha, G. Sarath, Syed Maraj Sultana, Formulation and Evaluation antimicrobial Herbal Soap, International Journal of Pharmaceutical Sciences Review and Research, Article no. 19, Published on Dec. 2021, 122 – 125.
- 7]. Seema U. Shinde, Nikita D. Gidde, Jamir A. Tamboli, Development and Evaluation of Antibacterial Polyherbal Bath Soap, International Journal of Pharmaceutical Sciences and Medicine (IJPSM), Vol.6 Issue. 5, May-2021, pg. 45-52, ISSN: 25.
- 8]. Dr. K. S. Jain, Dr. P. B. Miniyar, Dr. L. V. G. Nargund, Practical book of Pharmaceutical organic chemistry, first edition, Nirali prakashan, Jan. 2018, Page no. 4.3
- 9]. Prof. Chandrakant Kokare, Pharmaceutical Microbiology principles and application, sixteenth edition, Nirali prakashan, feb. 2019, Page.No 21.13 – 21.14.
- 10]. Schuman, K. and Siekman, K. Soaps in Ullmann's Encyclopedia of Industrial Chemicals, 2005.
- 11]. Taiwo, O. E. and Osinowo, F. A. O. Evaluation of various Agro- wastes for traditional Soap Production, Bioresources Technology, 2001, 79: 95-97.
- 12]. Olabanji, O., Oluyemi, E.A. and Ajayi, O.S. Metal analyses of ash derived alkalis from banana and plantain peels (*Musa spp.*) in soap making. African Journal of Biotechnology, 2012, 11(99): 16512-16518
- 13]. Aiwizea, E. A. and Achebob, J. I. Liquid Soap Production with blends of Rubber Seed Oil (RSO) and Palm Kernel Oil (PKO) with locally sourced Caustic Potash (KOH), Nigerian Journal of Technology, 2012, 31(1): 63–67

- 14]. Tortora G. J, Grabowski S. R., Principles of Anatomy and Physiology 10th edition published by John Wiley and Sons.
- 15]. Grace X. F, Sowmya K. V, Darsika C, Polyherbal Hand Sanitizer – Formulation and Evaluation, Indian Journal of Pharmacy and Pharmacology.
- 16]. Sunhyo R, Peter I. S, Chang H. S, Hyeonsook C, Yoonkyung P, Colonization and Infection of the Skin by *S. aureus* Immune System Evasion and the Response to Cationic Antimicrobial Peptides, International Journal of Molecular Science, Published on.
- 17]. Choudhari S, Sutar M, Chavan M, Formulation, Evaluation and Antibacterial Efficiency of herbal hand wash, Indo American Journal of Pharmaceutical Research.
- 18]. Sharma a, yadav r, guha v, soni u. N, patel j. R; formulation and evaluation of herbal hand wash, world journal of pharmacy and pharmaceutical sciences, 2016, 5(3): 675-683.
- 19]. Londhe j, jagpat s. D, doshi c, formulations of herbal hand wash with potential antibacterial activity, international journal of research in advent technology, 2015, 11-12.
- 20]. Khadbadi S. S, deore S. L, bhaviskar b. D, experimental phytopharmacognosy, a comprehensive guide, 1st edition, may 2011, 8.4.
- 21]. N. Benchikha, m menaceur and z. Barhi, extraction and antioxidant activities of two species *origanum* plant containing phenolic and flavonoid compounds, journal of fundamental and applied science, 2013, 5(1), 120-128.
- 22]. AOCS Official Method Da 3-48. Reapproved 2017; Alcohol- Soluble and Alcohol-Insoluble Matter in Soap and Soap Products, AOCS, 7th ed AOCS, Champaign, USA, 7 th ed. 1997.
- 23]. Ara, I.; Siddiqui, B.S.; Faizi, S. and Siddiqui, S, Tricyclic diterpenes from the stem bark of *Azadirachta indica*. *Planta medica*, 1990, 56(01), 84-86.
- 24]. Badal, R.M.; Badal, D.; Badal, P.; Khare, A.; Shrivastava, J. and Kumar, V, Pharmacological action of *Mentha piperita* on lipid profile in fructose-fed rats. *Iranian J Pharm* 2011, Res., 10(4), 843.

- 25]. Barbalho, S.M.; Damasceno, D.C.; Spada, A.P.M.; Silva, V.S.D.; Martuchi, K.A.; Oshiiwa, M. and Mendes, C.G, Metabolic profile of offspring from diabetic Wistar rats treated with *Mentha piperita* (peppermint). *Evid Based Compl Alter Med*,2011, 1-6.
- 26]. Vijaya Kumar, et al. Reported antioxidant activity on leaves, 790, 2003, 229-238
- 27]. Noorafshan A, Ashkani-Esfahani S. A review of therapeutic effects of curcumin. *Curr Pharm Des*, 19, 2013, 2032–46.
- 28]. Kulkarni S, Dhir A, Akula KK. Potentials of curcumin as an antidepressant. *Scientific World Journal*, 9, 2009, 1233–41.
- 29]. Zhang ZQ, Yuan L, Zhao N, Xu YK, Yang M and Luo ZP, Antidepressant effect of the ethanolic extracts of the roots of *Morinda officinalis* in rats and mice. *Chin Pharm J*, 35, 2000, 739-741.
- 30]. Reddy, Y. R. R., Kumari, C. K., Lokanatha, O., Mamatha, S., & Reddy, C. D, Antimicrobial activity of *Azadirachta Indica* (neem) leaf, bark and seed extracts. *Int. J. Res. Phytochem. Pharmacol*, 2013, 3(1), 1-4.
- 31]. Afsar, Z., Khanam, S., & Aamir, S, Formulation and comparative evaluation of polyherbal preparations for their disinfectant effects, 2015, 1 (1), 54-65.
- 32]. Dhanasekaran, M, *International research journal of pharmacy*, 2016, 7(2), 31-35.
- 33]. Kumar, K. P., Bhowmik, D., Tripathi, K. K., & Chandira, M, *Traditional Indian Herbal Plants Tulsi and Its Medicinal Importance. Research Journal of Pharmacognosy and Phytochemistry*, 2010, 2(2), 93-101.
- 34]. Ruckmani K, Krishnamoorthy R, Samuel S, Kumari H, LG, formulation of herbal bath soap from vitex negundo leaf extract, *journal of chemical and pharmaceutical sciences*, 2014 ; 6(4) :5202- 2503.
- 35]. Rangari V.D, *Pharmacognosy and phytochemistry*, 2nd edition reprint , career publication ; nashik; may 2012, 115.