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Formulation and Evaluation of Herbal Soap

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ABSTRACT

The aim of our study to develop the herbal organic soap by using process method and having antimicrobial agent. Herbal soap was prepared using palm oil, coconut oil, lavender oil, neem extract, different extracts were included into basic saponification reaction. A variety of soap solution concentrations were used to develop and assess the herbal formulation for antimicrobial tests, pH, moisture content, foaming index, foam retention duration, saponification, and TFM (total fatty matter) soluble matter. To cure different types of skin infections, oils are also included for everyday use.

Introduction.

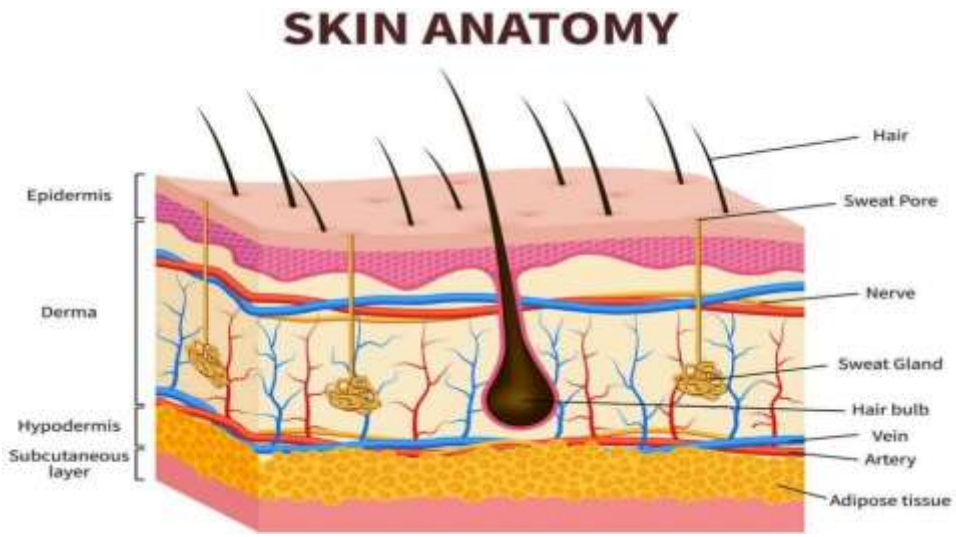
Botanical herbs and plant-based substances are often used to make herbal soap, a natural substitute for traditional soap. Because of its eco-friendly and skin-friendly qualities, herbal soap is becoming more and more popular. Because these soaps don't include harsh chemicals or artificial perfumes, they're especially good for those with sensitive skin. Additionally, since they contain natural chemicals, they are environmentally friendly and attractive to those looking for a gentler and more sustainable personal care solution. Eco-friendly soap is also made from herbs. Natural, biodegradable, and environmentally friendly components are used in its creation. Since no animal ingredients or byproducts are used in its production, herbal soap is cruelty-free and a compassionate and moral option for ethical shoppers. The advantages of using herbs in herbal soap include calming and mending the skin, giving off a natural scent, and using aromatherapy to lower tension and anxiety.

The antibacterial, antifungal, and anti-inflammatory qualities of the natural ingredients in herbal soap enable them to effectively treat a range of skin disorders, including psoriasis, eczema, and acne. You may easily select a herbal soap that meets your specific demands since it comes in a wide range of smells and compositions. In herbal soap, lavender, chamomile, pep-permint, rosemary, lemongrass, tea tree, calendula, oatmeal, aloe vera, clove, neem, turmeric, sage and comfrey are among the most often used plants.

Each plant has special qualities that improve skin health and well-being. Herbal soap is becoming more and more well-liked as a safe and environmentally responsible alternative for personal care items as concerns about artificial and chemical-laden goods develop.

Skin

- The biggest organ in the body, the skin is composed of minerals, water, protein, and lipids. In addition to controlling body temperature, the skin shields your body from infections.



➢ **Different type of skin**

1. Normal skin
2. Dry skin
3. Oliy skin
4. Combination

➢ **Normal skin**

Normal skin has the ideal oil content and balance of moisture. This type of skin can have some enlarged pores but smaller pores overall, even tone and touch smooth.

How to identify normal skinFine pores

-> Good blood circulation

-> A velvety, soft and smooth texture

-> A fresh, rosy colour uniform transparency

-> No blemishes

➢ **Dry skin**

skin type characterised by a lack of oil (sebum) Causes:Genetic predispositi.on.

Hormonal changes (e.g., ageing, menopause). External factors (e.g., harsh cleansers, weather

➢ **Oliy skin**

- Oily skin occurs when the skin's sebaceous glands produce too much sebum, a waxy,lt can be a natural consequence of the ageing process, as sebum production slows down. oily skin. Oily skin is characterized by an increased amount of lipids on the skin surface due to overactive sebaceous glands.

➢ **Cause**

- Genetics If one of your parents has oily skin problems, there is a big chance of you getting it too.
- Bacteria The tendency of oily skin to accumulate dirt will cause the germs to spread and cause skin infections.
- Hormone Permanent, as well as temporary hormonal imbalance, causes excess secretion of oil by the glands.
- Food-The food you eat directly impacts your skin conditions.
- Cosmetics+Some cosmetics might complicate the skin pH balance, causing dry skin or allergic reactions- to which the skin responds with excessive oil secretion.

Combination Of Skin

- Contact Combination skin is a skin type characterized by having both oily and dry areas on the face, Su often with the T-zone (fore-head, nose, and chin) being oily and the cheeks being dry or normal. This means that the skin's oil production varies across different areas of the face
- You might notice a shiny or greasy appearance in the T-zone while the cheeks feel tight or flaky.
- Common Problems with Combination Skin Acne and Breakouts Enlarged Pores.
- Combination skin often has visible pores, especially in the T-zone, which can be further exacerbated by excess oil and clogged pores.
- Blackheads and Whiteheads:
- These are also common issues with combination skin, as blocked pores can lead to both open (blackheads) and closed (whiteheads) comedones.
- Dry Patches

The cheeks can be dry and flaky, especially during winter, making it difficult to find the right skincare routine.

Skin related problem: -

High alkaline soaps contain a lot of un-saponified lye, which can irritate skin, especially for sensitive skin types like young children. Traditional soaps contain irritants that can cause dryness, contact dermatitis, inflammatory acne, and upset the delicate pH balance your skin maintains for your face and body.

- Contact dermatitis

Soap bars that contain the powerful antiseptic tetrachlorosalicylanilide (TCSA) can have some pretty serious side effects.

- TCSA was linked to an entire epidemic of photo allergic contact dermatitis in England in the 1960s. in harsh soap and cosmetics, can break out into a red, often itchy rash accompanied by dry, cracking skin, oozing blisters, swelling and burning. Steer clear of TCSA, as well as other trouble chemicals like anionic surfactants, which are widely accepted as potent irritants to human skin. They are the most commonly used class of surfactants due to their relative ability to solubilize fats and oils. They may also solubilize the lipid membranes of skin.
- PH damage
- For optimal operation, our skin must maintain a certain, somewhat acidic pH. Sebum, the skin's natural oil, makes up the majority of the acid mantle, a thin, protective layer. Both internal and environmental variables, such as nutrition, pollution, and harsh soaps, can produce abnormalities that compromise its integrity. To maintain healthy skin, the acid mantle must be allowed to function, and in order for it to do so, we must refrain from using cleansers that can alter the pH balance of the skin. Disturbances in the pH balance of the skin have been associated with very alkaline soaps, which contain a higher concentration of the lye responsible for saponification. In an investigation into how soap and detergents affected the pH of an infant's skin, washing with alkaline soap resulted in the most rise.

Function of skin

- Langerhans cells in the skin are a component of the adaptive immune system, which protects the body from harm caused by the internal and external environment. (See somatosensory system and hepatics.)
- **Sensation:** comprises a range of nerve endings that respond to pressure, vibration, heat and cold, touch, and tissue damage.
- **Heat Regulation:** By having a blood supply that is far larger than what is needed, the skin can precisely regulate how much energy is lost by radiation, convection, and conduction.
- **Control of Evaporation:** To prevent fluid loss, the skin acts as a semi-impermeable, relatively dry barrier. A major factor in the enormous fluid loss in butts is the absence of this function.
- **Aesthetics and Communication**: People can judge our emotions, physical condition, and attractiveness based on the appearance of our skin.
- **Herbal soap**

Herbal soap preparation is medicine it contains antibacterial and anti-aging, antioxidant antiseptic Properties which mainly use of part of plant like seed, rhizomes, nuts and pulps to treatment for an Injury or disease or to achieve health. 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 compability.

- **Role Herbal soap**

To remove all traces of make-up every day. For cleansing the skin.

For used as anti-aging.

Bath and renewal keeping the skin clean & shiny.

History of soap

- An alkali salt of a fatty acid makes up the chemical makeup of soap, a popular skin-cleaning product. Ancient Babylonians are the first people to use soap thousands of years ago. An alkali called "lye" formed from woody ashes was used to boil animal fat, creating the first soap, a greasy substance with a disagreeable odour. Since then, soap has evolved, becoming more diverse and including different components to make it more aesthetically pleasing. Skin cleansers nowadays contain more than just surfactants; they also contain skin-conditioning ingredients, as the word "soap" suggests. For personal hygiene, religious rituals, or therapeutic purposes, the technique of skin cleaning has evolved over the course of several millennia. According to the "grihya sutras," the first known daily washing routine was practiced by ancient Indians. In the past, contaminants were scraped off with a piece of stone or bone to clean. The ash from the soapwort plant was suspended and used as a hand wash by later societies. Soap was not even used for cleaning by the ancient Romans, who invented public baths and aqueduct systems for flowing water. Cleopatra was said to have bathed with white fine sand and fragrant oils as abrasives.

  Tablets made of Sumerian clay from around 2000 B.C. contain the oldest known evidence of soap production. Before dyeing, the soap was used to remove grease from wool and was created by boiling a combination of fat and wood ashes. According to an Egyptian document called Ebers Papyrus, which dates back to 1550 B.C., the ancient Egyptians used a mixture of animal oil and ashes for their frequent baths. The Phoenicians were making soap by 600 B.C. from animal fat and wood ash. The Roman tale that referred to Mount Sapo, the site of animal sacrifice, is where soap earned its name. Along the slope, soap was created from woody ashes and animal fat that were washed away by the rain. It was this substance that the Roman ladies found useful for washing garments. In his book "Naturalis historia" dated 77 A.D., the Roman scholar Pliny the Elder stated that the earliest written account of the use of soap for personal cleanliness was written about soap created between 130 and 200 A.D.By 467 A.D., when Rome fell, bathing practices had deteriorated throughout Europe. During the Middle Ages, the plague and the Black Death were caused in part by filth and poor living conditions.

Literature survey

- P. Yudharaj et.al - 2016

This reference help in the excipients profile of research.

- Cavitch, Susan M. 1995

What is soap, how saponification reaction occurs, method of soap making, types of soap and it's benefits.

- Rakesh K.Sindhu*et.al-2019

The formulation was prepared then evaluation for the analysis of pH, Moisture content, foaming index, foam retention time, saponification, ethanol soluble matter and antimicrobial activity.

- Park and T.H.Jo* et. al-2006

About aleovera, biological source characteristics, geographical, location, it's benefits. This all reference help in research of soap.

MATERIALS OF METHOD

1. NEEM

Synonym:Margose

family Meliaceae

Leaves: Alternate, exstipulate, imparipinnate leaflets 5.0-10 cm in length lanceolate closely clustered towards the ends of branches.

Bark: Moderately thick, rough, brown in colour longitudinally and obliquely furrowed Internally starchy white,

- Chemical Constituents

Good number of chemicals isolated from the plant belong to the classes diterpenes (sugiol), nimbiol (bark), triterpenes B-sitosterol, stigmasterol (leaf), Limonoids: Maliantriol iseed oil) nimbidinine (seed oil), Nimbendiol (seed oil) nimbin and azadiractin (seed), chemically azadiractin is tetra nor tritarpinoid. sulphurous compounds: Number of cyclic tri and tetrasulphides (leaves), flavonol glycosides Nimaton, quercetin, myrecetin, kaempferol.

Fig.1

- Uses : Recently, it has been studied scientifically and reported that it contains different chemicals which have insect repellant, insecticide, antifeedant, nematicide and antimicrobial properties. The seed oil has spermicidal activity. Neem is also blood purifier and has skin glowing.

2. Palm oil

Synonym: red oil palm

Biological source: the fixed oil obtained form fleshy orange-red mesocarpof fruits elasi-guineensis.

Chemical Constituents Plam oil contains several fatty acids, carotenoids and sterols. Fatty acids are palmitic acid-45%, oleic acid 39.0%, lenoleic acid 10.0%, Carotenoids are a & B carotenes, tocophens Le tocotrienol, B-sitostarol

Uses

It is mainly used as edible oil used for cooking and frying after refining only. It is cocoa-buter substitute. It is used in preparation of margarines, soaps and oleo-chemicals, in cosmetics, personal care products, in skin conditioners and also as solvent.

3. Shikakai

Synonym: Shikakai Tree, Soap Pod, Acacia concinna

Physical characteristics

Texture: Smooth surface, hard and woody Pods normally measure between 5 and 15 centimeters in length.

Uses

Skin Care :Because shikakai is a strong anti-bacterial, it can effectively treat a variety of skir including scabies, and it also minimizes the appearance of fine lines and wrinkles.

4. Reetha Powder

Biological Name: Sapindus mukorossi

Family: Sapindaceca

Chemical Constituents:

Saponins: These are natural surfactants that produce a lathering effect and act as gentle cleansing agents. Sugars: Act as natural humectants, helping to retain moisture in the skin and hair.

Uses: in natural skincare and haircare routines, mainly for its cleansing properties:

1. Natural Cleanser, Soap Substitute: It acts as natural soap alternative

5. Coconut oil

Biological Name: Cocos nucifera tree

Family:Arecaceae

Chemical Constituents: Watwr, carbohyadrats, fiber,protein,vitamins,minarals,and various bioactive compounds

Uses: Mosturizing,reducing inflamamtionn and fighting acne

6.Bees Wax Synonym:Beeswax, Cera-flava

Biological source:Yellow bees wax is purified wax obtained by melting the woofery mellitica and other species of Apis

family :Apida

Chemical constituents :

It is processed and commercially prepared in France, Italy, West Nrices

Chemical Constituent:Esters of fatty acid , fatty alcohol, along with hydrocarbons,free fatty acid

Uses: Crate protective Barrier,reducing Inflammation ,Itching

4. Formulation And Evaluation

Sr.No	Ingredient	Quantity
1	Neem Powder	60gm
2	Palm Oil	400ml
3	Shikakai Powder	10gm
4	Reetha powder	10gm
5	Coconut Oil	50ml
6	Bees Wax	20gm

Procedure

Step1: take 20gm neem powder dissolve into 200ml water.

Step2: stir these aqeous solution and filtet it and making it extract.

step3:take 40 gm neem powder dissolve into 400 ml palm oil and stirr it properly.

Step4: placed these oily solution in oven at 120°c for 3 hours and filter it then making it extract.

Step5: both aqueos and oily solution mix and added into 10 gm ritha, 10 gm shikhkai, 50ml coconut oil and put into low heat for 30 min.

Step 6: then cool these solution and add into flavouring agent lavender oil 2/3 drops and transfer into the mould

Evaluation parameter

- **Organoleptic Eavaluation**

In order to determine the soap's hue and assess the purity of the prepared Poly herbal soap, it was visualised on a white backdrop.

Determining Size and Shape

Approximately 8 cm in height and 4 cm in breadth, the prepared herbal soap is square in shape. This size of prepared soap is perfect for frequent use on the body's afflicted skin areas. A scale with a ruler was used to measure the prepared soap's thickness.

Odour: The smell was described as being both pleasant and fragrant. Due to the use of essential oil to the composition, there is an odour.

Texture is the appearance. Physiochemical soil mass Evaluation

A pH paper was used to measure the pH, and it was discovered to be basic.

It was manually found to be consistent. In addition to the marketed formulation, all three formulations exhibit semisolid consistency.

Foam retention period: The term "foam retention time" describes how long the foam that the soap produces lasts. For around five to ten minutes, the foam interval was monitored after repeating the previous process.

Foamability was measured by placing a little quantity of gel in a beaker filled with water. Following ten shakes of the beaker, the initial volume was recorded, followed by the final volume. The final volume was more than the original one, as demonstrated by shaking a 19-meter sample in 10 millilitres of water after the initial volume was measured. Each of the three formulas is present.Antimicrobial test: there was various study conducted on antimicrobial activity of name and hence according to research paper by antimicrobial activity of Azadiricta indica leaf, bark and seed extract.

One of the important parameter by which we can say that such formulation can easy to apply and evenly apply on face skin if it does not contain any gritty particle, so it can gives batches does not contain any gritty particle so there are easy to apply.

Saponification value determination:

The saponificatina value for the dilated soap solution was found to be 56.66 which is suitable in be used in consumer products.

Determination of moisture content:

The percentage of moisture content in the herbal soap was evaluated to be 5.5%. The moisture content was low as greater the moisture, more will the deterioration of the sample.

- **Thermostaibility**

Herbal soaps generally maintain their stability at room temperature, but may become unstable with increasing temperature or humidity. Studies often evaluate thermal stability by storing soap samples at various temperatures (e.g., 30°C, 35°C, 45°C, 50°C) for a set period (e.g., one month) and observing for changes in color or phase separation. Some herbal soaps may show slight drying or changes in texture at higher temperatures, while others remain stable at room temperature for extended periods.

Thermal stability refers to a material's ability to resist changes in its physical or chemical properties when exposed to varying temperatures. In the context of herbal soap, it means the soap's ability to maintain its form, color, and other characteristics without significant degradation.

Sr.no	**Parameters**	**Observation**
1	Colour	Green
2	Odour	Charateristics
3	Irritation	No Irritation
4	Consistency	Semi-solid
5	Foam Retention	3 mint
6	PH	7.0

RESULT

Making and testing multifunctional herbal soap was completed. They identified the manufactured soap's physicochemical properties. The PH was determined to be within the specified range, and the formulations also showed satisfactory cosmetic characteristics. Other parameters such as percentage Foam height, Foam retention, and Moisture content were determined the pH of the herbal formation was 7-8 which was optimum for use on the skin. Both a higher and a lower soap pH indicate negative skin consequences. Five minutes was the foam retention duration, and the foaming index of the specified herbal mixture was 16.5. This means the lather- producing ability of the soap was satisfactory and stable the moisturizing effect of herbal soap was studied it leaves skin soft and hydrated for safety and a sensitivity test was performed in this test patch test is performed which showed no adverse reaction was found

The herbal soap were formulated and evaluated for color, odour, Consistency, pH, Spread ability, Wash ability, Grittiness, Foamability and obtained results.

CONCLUSION

Herbal soap is a natural and eco-friendly alternative to conventional soap that is gaining popularity due to its numerous benefits. It is made from herbs and plant-based ingredients that provide natural fragrances and healing properties, making it ideal for sensitive skin. The various herbs used in herbal soap can soothe and heal the skin, enhance aromatherapy benefits, and provide other health benefits such as reducing stress and anxiety. During this project work our team had finally achieved the desired results and formulation to make the poly herbal soap which does not contain any harmful chemicals. The pH between 6.5 to 7. Volunteers responded well and gave good feedbacks by using these poly herbal soaps. Soaps were found to be skin friendly. It

was nice learning and a great achievement for our team to prepare the poly herbal soap with balanced pH. Furthermore, the prepared soap was evaluated by testing various physic-chemical properties such as pH appearance, colour, odour, antimicrobial, TFM in which they exhibit satisfactory effect.

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