

Formulation and Evaluation of Polyherbal Soap by Using Natural Plant Extract

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Abstract:

Since the beginning of time, people have employed medicinal plants as a form of treatment. As a natural cure, the extract made from the leaves, stems, and roots of numerous medicinal plants has been used to treat a variety of maladies and disorders. The majority of bacterial disorders occur in humans. Herbs are recognized to have a variety of potential benefits for humans, including anti-inflammatory, antibacterial, and antifungal aspects that have been looked over for decades and used in a variety of ways. One example of this is the formulation of herbal soap, which is used both for treating microbiological diseases and daily use. The intent of this study is to create an inventive herbal soap using a combination of herbal extracts. This study also assesses the soap's physicochemical properties. Plants are readily available, and their efficacy makes it possible to create products that are beneficial and affordable with few or no adverse effects.

Keyword: Herbal extraction, Anti inflammatory, Anti bacterial, Anti fungal

CHAPTER: 1 INTRODUCTION

TOPICAL PREPARATION:

INTRODUCTION OF SKIN CLEANING PRODUCTS :

- Skin cleaning products include soaps, gels and liquids that are formulated to provide the right care to your skin and help it look glowing and healthy.
- The general purpose of skin cleaning products is to remove and clean soiling, excessive skin parts (skin sweat, scales, sebum), unwanted micro-organisms and the existing residues of medicinal or cosmetic preparations from the surface of skin.
- Cleansing skin care is one of the most important things that we can do to help keep our skin looking glowing, healthy and beautiful.
- Without cleansing, our faces may develop a build-up of materials, which would make our faces look dirty, shiny and dull. The build-up of bacteria and dirt on our face may also increase the risk of bacterial infections, which may lead to skin disorders, such as acne.
- Cleansing is especially important for people with oily skin, who have excess oil on their face that attracts dirt and debris.
- A wide range of skin cleaning products is available in the industry that is formulated for different skin types, different functions and properties. It is important that people select the right kind of skin care product for their skin, as it will treat their problem areas and will prevent any further skin damage from occurring.

Types:

Depending on the form, usage and application, the skin cleansing products can be broadly categorized into following five types

- Toilet Soaps
- Body Soaps
- Face Wash
- Cleansing Milk
- Cleansing Cream
- For getting maximum benefit from your skin care regiment, it is important that you know your skin type. There are different types of skin and hence you should take care of your skin accordingly. The effective way to treat your skin is to know your skin type and what kind of nutrients the skin needs and act accordingly.
- Skin can be divided into different types according to its texture. The different types of skin are -
 - Normal skin
 - Dry skin
 - Oily skin
 - Combination
- A normal skin has fine texture with smooth and supple surface. This type of skin has a proper balance between the oil and moisture contents and hence it looks neither greasy nor dry. The skin looks clear and does not develop any spots or blemishes. The pores of the skin are fine and barely visible and reflect good health. A normal skin requires gentle treatment
- This type of skin is dry parched in appearance and has a tendency to flake easily. The skin is prone to wrinkles and lines, which is due to its inability to retain moisture. Dry skin often suffer problems in cold weather condition and ages faster than normal or oily skin. Constant care and protection of dry skin is very important. It needs a moisturizer during the day and a good cream at night.
- The over secretion of sebum, which makes the skin surface looks oily, can cause an oily skin condition. The excess oil on the skin surface attracts dirt and dust from the environment. This type of skin is also prone to black heads, whiteheads, spots and pimples. This type of skin requires thorough cleaning and extra care.
- Combination skin is very common and as the name suggests, it is a combination of both dry and oily skin, with certain parts of the body oils and rest dry. Generally there is a central greasy panel that consists of the forehead, nose and chin and a dry panel, which consists of the cheeks and the areas around the eyes and mouth. In a combination skin, the different parts of the body should be treated accordingly

INTRODUCTION OF HERBAL SOAP :

- Most of the commercial soaps contain chemicals that can be harmful to the skin and using a natural herbal soap can be a good alternative.
- 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 effect.
- Some of the natural soap manufacturers also use aroma therapy and herbal treatments to offer the best skin treatment solution for your skin.
- Made of rare herbs and 100% natural ingredients, herbal soaps have found to be highly beneficial

for the skin.

- 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. These soaps also contain super fatty oils, Vitamin E, aloe vera and essential oils, that all lead to the goodness of skin and overall health.
- Herbal soaps are also effective in curing different skin complaints. These soaps also contain glycerin, which is generally not used in commercial soaps.
- Glycerin helps in retaining the moisture in the skin thereby making these soaps for dry skin conditions.

Herbal soap :

- 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.

SOAP :

- Soap is common cleansing agent well known to everyone. Many authors defined soap indifferent ways. Warra,¹⁹ regarded it as any cleaning agent, manufactured in granules, bars, flakes, or liquid form obtained from by reacting salt of sodium or potassium of various fatty acids that are of natural origin (salt of non-volatile fatty acids).
- Soap can also be said to be any water-soluble salt of fatty acids containing eight or more carbon atoms. Soaps are produced for varieties of purpose ranging from washing, bathing, medication etc.
- The cleansing action of the soap is due to the negative ions on the hydrocarbon chain attached to the carboxylic group of the fatty acids. The affinity of the hydrocarbon chain to oil and grease, while carboxylic group to water is the main reason soap is being used mostly with water for cleaning purposes.
- In addition to basic raw materials, other substances are added to the composition in order to improve its application. For examples soap made for medicinal purposes other medicinal importance ingredients are added to it to produce medicated soaps. In addition to potassium and sodium salt, other metals such as calcium, magnesium and chromium are also used to produce metallic insoluble soap that are not used as cleaning agents, but are used for other purposes.
- Other properties of the soap such as hardness are function of the metallic element present in the salt. For example soap made up of Sodium salts shows little hardness compare to potassium salts soaps, provided the same fat or oil is used in both cases.
- These are characteristically different from soaps made from divalent metals such as magnesium, calcium, aluminum or iron which are not water soluble, Soaps are use for laundry and cleaning purposes, though the used of calcium soap in the formulation of animal feed have been reported .
- It is generally known that soap is produced by the saponification of a triglyceride (fat or oil). In the process the triglyceride is reacted with a strong alkali such as; potassium or sodium hydroxide to

produce glycerol and fatty acid salts.

Herbal Cosmetics:

- ❖ The word cosmetic was derived from the Greek word “kosmtikos” meaning having the power, arrange, skill in decorating.
- ❖ The origin of cosmetics forms a continuous narrative throughout the history of man as they developed. The man in prehistoric times 3000BC used colours for decoration to attract the animals that he wished to hunt and also the man survived attack from the enemy by colouring his skin and adorned his body for protection to provoke fear in an enemy (whether man or animal).
- ❖ The origin of cosmetics were associated with hunting, fighting, religion and superstition and later associated with medicine.
- ❖ Herbal Cosmetics, here in after referred as Products, are formulated, using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only, shall be called as Herbal Cosmetics.
- ❖ Beginning 1990's cosmetic manufacturer adapted a term 'cosmeceutical' to describe the OTC skin care products that claims therapeutic benefit by addition of plant based active ingredient such as alpha-hydroxy acid, retinoic acid, ascorbic acid and coenzyme Q10.
- ❖ These active ingredients serves many purposes viz. increase in skin elasticity, delay in skin aging by reducing the wrinkles, protection against UV radiation by antioxidant property and to check degradation of collagen respectively.
- ❖ The skin and hair beauty of individuals depends on the health, habits, routine job, climatic conditions and maintenance.
- ❖ The skin due to excessive exposure to heat will dehydrate during summer and causes wrinkle, freckles, blemishes, pigmentation and sunburns. The extreme winter cause damages to the skin in the form of cracks, cuts, maceration and infections.
- ❖ The skin diseases are common among all age groups and can be due to exposure towards microbes, chemical agents, biological toxin present in the environment, and also to some extent due to malnutrition
- ❖ The only factor they had to rely on was the knowledge of nature compiled in the ayurveda. The science of ayurveda had utilized many herbs and floras to make cosmetics for beautification and protection from external affects.
- ❖ The natural content in the botanicals does not cause any side effects on the human body; instead enrich the body with nutrients and other useful minerals.
- ❖ The cosmetics, according to the Drugs and Cosmetics Act is defined as articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance.
- ❖ The cosmetic does not come under the preview of drug license. The herbal cosmetics are the preparations containing phytochemical from a variety of botanical sources, which influences the functions of skin and provide nutrients necessary for the healthy skin or hair.
- ❖ The natural herbs and their products when used for their aromatic value in cosmetic preparation are termed as herbal cosmetics.
- ❖ There is common belief that chemical based cosmetics are harmful to the skin and an increased awareness among consumers for herbal products triggered the demand for natural products and

natural extracts in cosmetics preparations.

- ❖ The increased demand for the natural product has created new avenues in cosmeceutical market. The Drug and Cosmetics Act specify that herbs and essential oils used in cosmetics must not claim to penetrate beyond the surface layers of the skin nor should have any therapeutic effect.
- ❖ The legal requirement and the regulatory procedures for herbal cosmetics are same as that for other chemical ingredients used in cosmetic formulations.

The requirements for the basic skin care:

- ❖ **Cleansing agent:** which remove the dust, dead cells and dirt that choke the pores on the skin. Some of the common cleansers include vegetable oils like coconut, sesame and palm oil.
- ❖ **Toners:** The toners help to tighten the skin and keep it from being exposed to many of the toxins that are floating in the air or other environmental pollutants. Some of the herbs used as toners are witch hazel, geranium, sage, lemon, ivy burdock and essential oils.
- ❖ **Moisturizing:** The moisturizing helps the skin to become soft and supple. Moisturizing shows a healthy glowing skin.

The Benefits of Herbs May include the Following:

- ✓ Enhance physical and mental well-being Strengthen the immune system Detoxification Aid in sleeping, digestion Increase stamina and reduce fatigue etc.
- ✓ Herbal products in cosmetics or herb in cosmetics can also be referred as botanical origin products in cosmetics.
- ✓ According to the Drugs and Cosmetics Act 1940 cosmetics may be defined as, any substance intended to be rubbed, poured, sprinkled, or otherwise applied to human being for cleansing, beautifying, promoting attractiveness.
- ✓ Cosmeceutical are the cosmetic products which contain biologically active principles or ingredients of plant origin having effect on user or they are combination product of cosmetics and pharmaceuticals intended to enhance the health and beauty of skin.
- ✓ Herbal cosmetics are defined as the beauty products which possess desirable physiological activity such as healing, smoothing appearance, enhancing and conditioning properties because of herbal ingredient.

Advantages of Herbal Medicine:

- ✓ Herbal medicine have long history of use and better patient tolerance as well as acceptance.
- ✓ Medicinal plants have a renewable source, which is our only hope for sustainable supplies of cheaper medicines for the world growing population. Availability of medicinal plants is not a problem especially in developing countries like India having rich agro-climatic, cultural and ethnic biodiversity.
- ✓ The cultivation and processing of medicinal herbs and herbal products is environmental friendly. Prolong and apparently uneventful use of herbal medicines may offer testimony of their safety and efficacy.
- ✓ Throughout the world, herbal medicine has provided many of the most potent medicines to the vast arsenal of drugs available to modern medical science, both in crude form and as a pure chemical upon which modern medicines are

CHAPTER: 2 REVIEW OF LITERATURE

1. **Patil J N et al.,(2023)** in their article entitled “Formulation and Evaluation of Camphor aloe soap” stated that numerous chemical toxins microorganism present in the atmosphere may cause chemical infection and damage to skin cosmetic alone are not sufficient to take care of the skin and body.
2. **Rashid N A et al., (2022)** The reported of evaluation of butterfly peaflowers for antioxidant activity and its potential as antioxidant soap, *Clitoria ternatea*, often known as butterfly pea, is a flowering vine plant in the Fabaceae family with oval and acute leaves. Due to free radicals, many severe diseases were occurred such as cancer, diabetes, and cardiovascular and neurological illnesses.
3. **Patel A et al.,(2022)** in their article entitled “ Formulation and Evaluation of Herbal Soap” they formulate herbal hygienic soap by using cold process method and having antimicrobial agent. herbal soap was prepared using Coconut oil,Castor oil,lavender oil and rose oil.
4. **Chandira R M et al.,(2022)** in their article entitled “Formulation and Evaluation of herbal Soap using melt and Pour Method” they Formulate soap using musk melon, olive oil, soap base. Soap is used for treating several epidermal dysfunctions, such as eczema, psoriasis,and acne.
5. **Govind A, et al., (2021)** in their article entitled “Formulation and Evaluation of herbal soap by using natural ingredients by using simple matched” stated that the plant used in soap preparation is able to soft the skin epidermis enhanced greater penetration remove acne as well as promote healing and resolution in quickly in time.
6. **Attallah A et al.,(2021)** in their article entitled “Formulation of herbal soap against acne causing bacteria” in their article they formulate soap for anti- bacterial activity
7. **Munde Govind Anant et al., (2021)** The reported is formulation and evaluation of herbal soap by using natural ingredients by simple matched, Theherbal soap was formulated by using leaf of neem, Aloe Vera, and tulsi ayurvedic cosmetics is very helpful and does not give it side effects. Ayurvedic cosmetics are also known as herbal cosmetics.
8. **Vasanthan A et al.,(2021)** in their article entitled “Formulation and Evaluation of Antifungal Soap Using *Acalypha indica*” Herbal cosmetics are very significance because of their good activity and without side effect. *Acalypha indica* is antifungal plant which play an important role in treating skin problem caused by fungi.
9. **Devi S A et al.,(2021)** in their article entitled “ Formulation and Evaluation ofAntimicrobial Herbal soap” The main objective of the present study are formulate and Evaluate anti-bacterial herbal soap using *Azardica indica*, *Ocimum tenuiflorum* oil.
10. **Ahmed L et al., (2021)** in their article entitled “ Formulation and Evaluation of an ayurvedic bath soap containing extracts of three ayurvedic herbs” the ultimate aim of study is to formulate and evaluate the ayurvedic bath soap using methanolic extracts of three plant having ethnic and dermatological importance in Ayurveda, namely, aloe vera, neem and palm oil.
11. **Kurli M & Yadav Y et al.,(2020)** in their article entitled “Formulation and Evaluation of Polyhrbal Paper soap”in their study they formulate Paper soap. This frequently used hand wash prerpration.
12. **Jacob B et al., (2019)** in their article entitled “Formulation and Evaluation of Herbal Soap” Stated that most of the commercial soap and Detergents containchemical that can be harmful in the skin. Using natural herbal soap and detergent can be good alternative. They Provide relaxation, healing from stress.
13. **Manjusha G K et al.,(2019)** in their article entitled “ Formulation and Evaluation of Herbal Bath Soap Containing Methanolic Extracts of Three Ayurvedic Varnya Herbs” in their article they

formulate Herbal bath soap using methanolic extracts of three plant having ethnic and dermatological in Ayurvedic namely Hemidesmus indica, Cyperus rotundus, and saussurea lappa.

14. **Chandy V, Ciyamol et al., (2019)** in their article entitled “Formulation and Evaluation of herbal soap” stated that formulated using herbal ingredient and evaluated for various physicochemical features.
15. **Saudagar R B, Sisodiya M H et al., (2018)** in their article entitled “Review on herbal cosmetics” stated that the herbal cosmetics are the most important part of the today’s modern life as they are used for the beautification purpose.
16. **Varsha M Chaudhari et al., (2016)** The reported of studies on antimicrobial activity of antiseptic soaps and herbal soaps against selected human pathogens, In the present study antimicrobial activity of various antiseptic and herbal market soaps were determined against bacterial activities of various soaps on such micro flora pathogens were studied

CHAPTER: 3 AIM AND OBJECTIVE

Aim: Formulation and Evaluation of Herbal Soap.

Objective:

- The main objective was to formulate medicated herbal soap having anti- microbial, anti-bacterial properties and rich in antioxidant.
- Formulate the herbal soap with minimum side effect.
- The main purpose of preparing herbal soap is to use natural ingredients instead of using chemicals.
- The objective of this work is formulation and evaluation of herbal soap using marigold powder, orange peel powder, sandal wood powder and hibiscus powder.





PLAN OF WORK:

Preparation of Herbal Soap Carried out by Following Steps:

1. Literature survey
2. Formulation of herbal soap
3. Evaluation test for herbal soap
 - Physical parameters
 - PH
 - Determination of percentage free alkali
 - Foam height
 - Foam retention
 - Anti-bacterial test
 - Saponification

Chapter: 4 MATERIALS AND METHOD

Materials:

Sr no.	Ingredients	Figure	Uses
1.	Orange peel powder <i>(citrus sinensis)</i>	 <p>(Figure :1)</p>	It has anti-microbial and anti-bacterial properties
2.	Marigold flower powder <i>(calendula officinalis)</i>	 <p>(Figure:2)</p>	It reduces inflammation, acne, burns, rashes. It provides pleasing, natural aroma to the soap and It promotes healthy skin
3.	Hibiscus flower powder <i>(Hibiscus rosa)</i>	 <p>(Figure:3)</p>	It provides pink color. It is rich in antioxidant
4.	Sandalwood powder <i>(Santalum album):</i>	 <p>(Figure:4)</p>	It helps to hydrate the dry and aging skin. It also relieves the irritation and itching

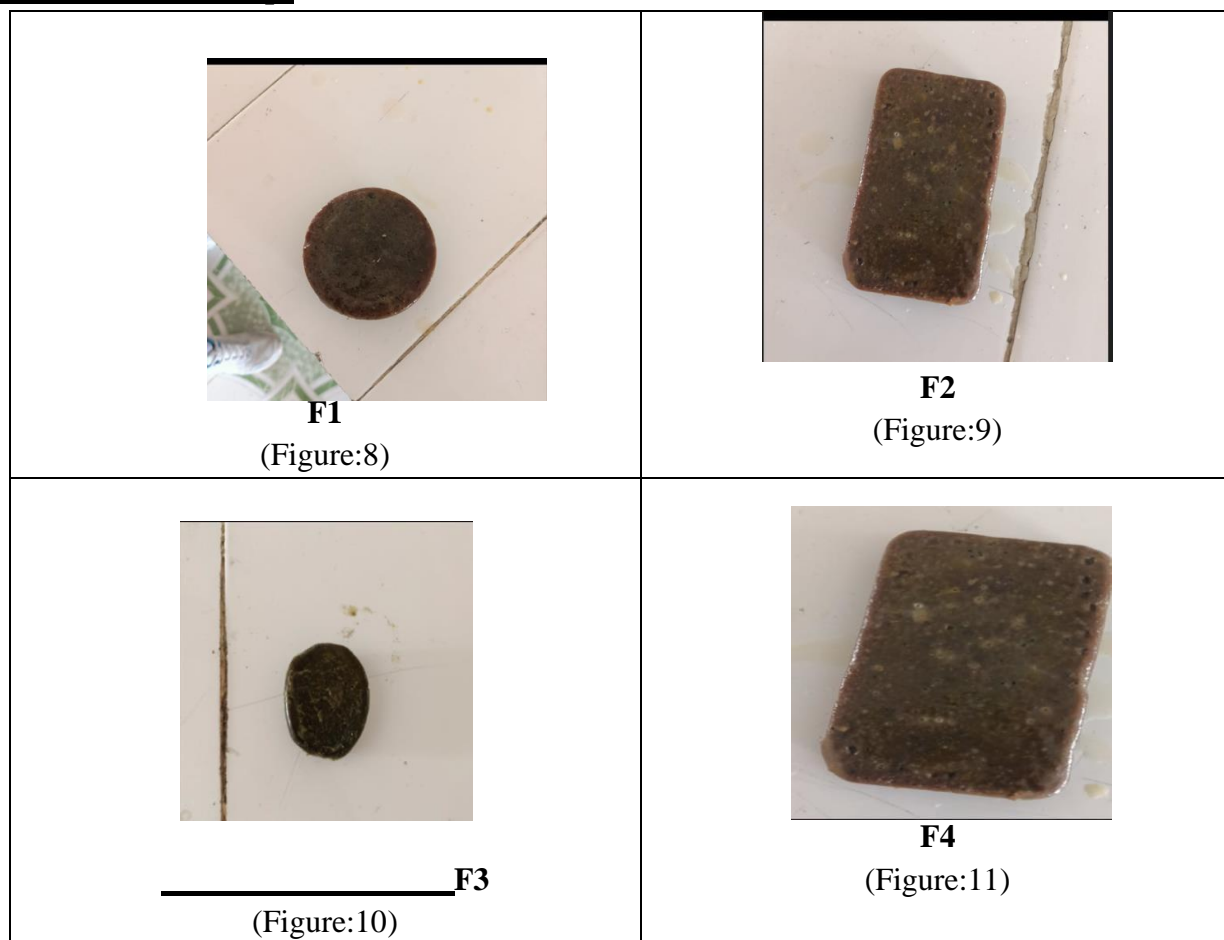
5.	Reetha Powder (<i>Sapindus mukoross</i>)	 <p>(Figure:5)</p>	Reetha is widely used in preparations like shampoo and soap. The dried fruit powder may be used as a foaming agent in soap and shampoos.
6.	Glycerine soap base	 <p>(Figure:6)</p>	Used as Soap Base.
7.	Glycerin	 <p>(Figure:7)</p>	Moisturizing Agent

(Table:1 Materials)

Method Of Preparation:

- 1) Get a heat-resistant bowl that can withstand boiling water and hot steam. This bowl will become the top half of your double boiler.
- 2) The double heat method used for the melting glycerin soap base, so give flame on induction and add some water then add now you have to put the Glycerin soap base piece in the container and melt it.
- 3) After base is melt add all ingredients in the melt soap and mix it proper.
- 4) Mix it then finally Stop heat and add Orange essential oil in the preparation solution.
- 5) After you have mixed everything evenly, you have to pour the soap into the mold
- 6) Lastly, you have to wait until the soap has hardened and is ready to use.
- 7) Final soap is ready and it packing in the paper.

Formulated herbal Soap:



CHAPTER: 5 EVALUATION PARAMETER

- ❖ The following Physico-chemical parameters were assessed for determining the quality of prepared formulation against marketed herbal Soap.
- ❖ **Physical parameters:** The colour and odor of the prepared soap were observed with naked eye keeping it on white background. The order of the soap was smelled.

Parameter	F1	F2	F3	F4
Colour	Dark Green	Dark Green	Dark Green	Dark Green
Odor	Orange	Orange	Orange	Orange
Shape	Round	Rectangle	Oval	Round

(Table:2 Physical Parameter)

❖ **pH:** the pH was determined by using pH paper, the pH was found to be 6-7.



(Figure: 12)

Parameter	F1	F2	F3	F4	Standard value
pH	8	7	6	6	6-7

(Table: 3 pH value)

❖ **% 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.



(Figure:13)

❖ **Foamability :** 50 ml of distilled water was taken and 2 gm of soap sample was dissolved completely by stirring. It was then transferred into a 250 ml measuring cylinder along with washings. The volume was made up to 200 ml by adding distilled water. 25 uniform strokes were given to the mixture and kept stand still for some time until the water volume comes to 200 ml. The foam height was measured from above the water volume.



(Figure:14)

Parameter	F1	F2	F3	F4
Foamability	9cm	10cm	11cm	13cm

(Table: 4 Foamability)

- ❖ **Foam stability:** Same quantity of soap sample and quantity of distilled water along with process was carried out as that of foamability and the mixture was kept stand still for 30 min. After 30 min measurement of foam height was done from above the water volume.

Parameter	F1	F2	F3	F4
Foam Stability	3min	4min	5min	6min

(Table 5 Foam Stability)

- **Saponification Value:** 2 gm of substance refluxed with 25ml of 0.5 N alcoholic KOH for 30 min, to this 1 ml of Phenolphthalein added and titrate immediately with 0.5N HCL note the reading As a repeat the operation and examined.



(Figure :15)

Anti-bacterial test:

- The microbiological assay of antibiotics is done by comparing the zone of inhibition formed by the microorganisms to a specific concentration of antibiotics having a known activity. There are different types of methods for microbiological assay of antibiotics like cup plate method and disc diffusion method.
- In the cup plate method, antibiotic containing cylinder is diffused into the agar layer containing the microorganisms. The zone is formed around the cylinder. The other method is disc diffusion method where zone of inhibition is measured around the antibiotic disc. The basic objective is to study various methods of microbiological assay.

Cup-plate: Prepare nutrient agar plate inoculated with test organism, with a depth of 4-5mm and then allow it to solidify. Divide the NA plate into four equal portions. Then with the help of a sterile borer make four cavities one in each portion. Then fill three cavities with antibiotic solution and in one fill the standard solution. Slowly incubate the plates at 37⁰C for 24 hours. After incubation measure the zone of inhibition.



(Figur :16)

CHAPTER 6 RESULT AND DISCUSSION

Sr.no	Parameter	F1	F2	F3	F4
1	Colour	Green	Dark green	DarkGreen	Dark green
2	Odor	Orange	Orange	Orange	Orange
3	Appearance	Good	Good	Good	Good
4	PH	8	7	6	6
5	Foam ability	9cm	10cm	11cm	13cm
6	am Stabilitytime(min)	3min	4min	5min	6min

(Table 6 Result and Discussion)

CONCLUSION

- The plant marigold powder, orange peel powder, sandal wood powder and hibiscus powder Used in formulation.
- The prepared formulation when tested for different test gave good results.
- Herbal soaps have a strong impact on the skin, in terms of making it soft, smooth and supple.
- On the contrary, chemical soaps are full of damaging substances that can harm the skin as well as health.
- The multiple benefits of herbal soaps make them the right choice for better skin care and optimal health outcomes. From the scent to the therapeutic value and the aromatic benefits to medicinal properties, herbal soap heals, soothe and rejuvenate the skin
- The prepared formulation when tested for different test gave good results.
- Furthermore the prepared soap were standardized by evaluating various physico chemical properties such as pH appearance odour in which the exhibit satisfactory effect.
- The pH of formula was change in F1 and F2 but F3 and F4 id best suitable for skin.F4 is found to be good as compare to other.
- F4 formulation is best compare to others, formulated herbal soap contain naturalingredients which are very beneficial as compare to chemical soap.

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