



# FORMULATION AND EVALUATION OF POLYHERBAL SOAP

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## Abstract:-

The aim of the present study is to formulate herbal soap containing castor oil, neem oil, mentha oil and further subjected to physicochemical characterizations such as colour, odor, texture, foam height, foam retention, irritation, saponification value and pH. The main ingredient, moong dal commonly known as green gram, has therapeutic qualities. The basic saponification reaction was combined with various extracts, including coconut oil, castor oil, neem oil, Mentha oil, rose petal extract, and NaOH (lye), to create the soap. After the herbal formulation was created, its pH and moisture content were tested. Foaming index, foam retention duration, saponification, TFM calculation, ethanol soluble matter, and antimicrobial activity using varying soap solution concentrations in comparison to standard technique. For herbal soap, the results showed that the pH was 6.5–7, the moisture content was 3.5%, the foam index was 16.5, the foam retention time was 10.0 minutes, the saponification value was 161.287 mg/ml, the TFM was 72%, and the ethanol soluble matter was 63.80%. Additionally, evaluation tests revealed that when compared to standard antibiotics, the herbal soap's antimicrobial results are satisfactory. Additionally, oils are added to various People are most commonly affected by bacterial skin infections, which need People are most likely to get skin infections caused by bacteria, which means treating and keeping healthy skin need careful consideration. There is antibacterial activity found in certain herbal plant extracts and their oils. The generated formulations demonstrated a strong antibacterial effect when tested using the agar well diffusion method against the bacteria Escherichia coli, Staphylococcus aureus, and pseudomonas aeruginosa. Excellent qualities were noted when the prepared formulations were assessed for a variety of physicochemical factors. The cost-effective advantages and minimal or non-existent side effects provided by plants' accessibility and efficacy are beneficial to manufacturers.

**Keywords:** Castor oil, neem oil, Nourishing, Polyherbal Soap, Saponification value.

## Introduction:-

Based on the technique of manufacture, natural soap can be broadly classified as melt-and-pour, hot process, or cold process. Transparent or translucent soap is the term used to describe hot process soap. The soap has a long-lasting scent, good moisturizing properties, good detergency or washing power, and is less irritating. To make herbal soaps, add different dried herbs and flowers. That ends in the base of soap. Because of their great

therapeutic potential, affordability, accessibility, and compatibility, herbs are natural items that can be used to treat nearly all illnesses and skin issues. It can therefore be used as a soap base.

Compared to the contents of commercial soap, herbal soap is free of artificial colors, flavors, fluorides, and other additives. Natural soaps make it simple to maintain the pH balance of the skin without upsetting it. Because of their great therapeutic worth, affordability, accessibility, and compatibility, herbs are the natural items that are most frequently used in the treatment of practically all diseases and skin conditions. This polyherbal soap formulation uses tomato juice, aloe vera gel, and moong dal powder (*Vigna radiata*) as natural plant ingredients, all of which have antibacterial properties.

People are most commonly affected by bacterial skin infections, which need although soaps are used to keep oneself clean and fresh, using chemical soaps can cause dry skin, skin damage, and skin allergies. Soaps containing chemicals lead to numerous illnesses and skin infections as well. They block the skin's pores, making it difficult for cells to breathe. It accelerates the aging process of the skin by postponing its natural renewal process. Additionally, the application of chemicals cause serious harm to the environment as well. The skin, which is the largest sense organ in the human body, serves as the body's first line of defense and also guards the pores to prevent damage to the body. Certain chemicals, such as SLS, DEA, BHT, Triclosan, isopropyl alcohol, fragrances, and colour dyes, have even been linked to cancer in humans.

The elevating Rise in the pursuit of herbal medicines has caused an increased demand of the larger production of herbal products (Mukherjee, 2015). Herbal medicinal products are in greater Demand than the synthetic ones because of many reasons:

- Lesser Side effects
- Better safety and efficacy
- Easily available
- Better compatibility with additives
- Potent therapeutic effect
- Cost-friendly (Saikia et al., 2006)
- Greater care for selection
- No requirement of animal testing
- Better compatibility with all types of skin (Joshi and Pawar, 2016).

People are most commonly affected by bacterial skin infections, which need the skin is the most exposed area of the body and is prone to a variety of foreign objects that can cause a number of skin-related illnesses. Thus, maintaining appropriate cleanliness and hygiene for the body's most exposed area is essential to shielding the skin from a variety of disorders and preventing the spread of pervasive microorganisms from the environment. Preventing Different Skin Disorders (Shah et al., 2014). Using soaps is a more effective and superior method of removing all dirt and foreign particles. When soap is used, its antimicrobial qualities assist in cleaning the skin. Many microorganisms, including *Klebsiella pneumoniae*, *Pseudomonas* spp., *Proteus vulgaris*, and *Staphylococcus aureus*, are the causative agents for a variety of skin infections. People are most commonly affected by bacterial skin infections, which need an estimated 186 billion US dollars are spent on soap.

Furthermore, the use of natural ingredients has increased dramatically in the current trends (Friedman et al., 1996). The earliest known use of basic soap dates back to the Egyptians, who combined animal fats and an alkaline plant to create crude soap. The popularity of herbal soaps has significance in the most recent years, different plant extracts have been added to the basic soap reaction. Herbal antimicrobial soaps are said to possess between 60 and 80 percent of the ability to prevent the growth of microorganisms. Making handmade and natural soaps has been a complete

- Ability of lather producing
- Colour of the soap
- Fragrance of the soap
- Moisturizing ability
- Compatibility of the skin
- Storage Stability (Berneck'e, 2013; Burke, 2005)

Fatty acids combined with alkali salts that come from plants or vegetables and include organic ingredients or natural smells are known as herbal soaps. There are two methods of preparation: a hot process and a cold process that both require the presence of bases like sodium and potassium hydroxide. In addition to the fats to materialize soap (Berneck'e, 2013). For craftspeople, the cold method is typically preferred. A number of variables, including the kind of alkali used, its hardness, foam height, solubility, etc., affect the soaps'quality. Burke (2005); Vivian and others, 2014). Depending on the qualities they provide, many types of oils are employed, including olive, castor, sunflower, palm, rice bran, and soybean oil.

## INGREDIENTS:-

### A) CASTOR OIL :-

The biological source of castor oil is the *Ricinus communis* L. plant, which belongs to the Euphorbiaceae family (Saxena et al., 1991). In essence, castor oil is a non-volatile, pale yellow substance. Furthermore, castor oil is not volatile in the natural world. Castor seeds contain between 40 and 50 percent oil, which is extracted using a variety of techniques (Abitogun et al., (2009). The mechanical approach and solvent extraction are two of these techniques. The previous method involves crushing the seeds and putting them in a steam tank to reduce their moisture content. After that, they are put in a hydraulic press mechanically to extract oil. Nevertheless, the latter approach is used in conjunction with the later.



Fig. No. 1 Castor oil

### B) NEEM OIL:-

Produced from the Neem tree, also known by its botanical name, *Azadirachta indica*. Neem trees are native to practically all of India, Pakistan, and the surrounding nations, and they belong to the Meliaceae family. Fundamental characteristics of neem oil: in liquid form, it is typically yellowish greenish brown. The oil tastes harsh and a little bit unpleasant aroma. According to Mongkholkhajornsilp et al. (2005) and Dasa Rao and Seshadri (1941), this is the outcome of sulfur's latency as a volatile element. According to Liauw et al. (2008) and Khanam et al. (2017), there are three different extraction techniques for removing the oil from neem seeds: mechanical extraction, solvent extraction, and the SFE (super critical fluid method). In addition to being used to treat pain, neem oil is believed to have antibacterial qualities.



**Fig. No. 2 Neem oil**

### C) MENTHA OIL:-

Botanically derived from the flowing leaves of *Mentha piperita* and belongs to the Lamiaceae family. The plant commonly known as peppermint originated in Europe and is now grown practically everywhere in the world (Wikipedia, 2011; Saller, 2004). The chemical composition of Mentha as an essential oil includes methyl esters, alcohols, ocimene, terpenes, thujone, Acetaldehyde, Menthone, isomenthone, and sabinene (Badal et al., 2011; Barbaljo et al., 2011). It's claimed that this essential oil has strong antimicrobial activity against bacteria like *Escherichia coli* and it gives the soap formulation more antioxidant properties (Tsai et al., 2017). As a volatile oil, mentha oil can help with mood enhancement and mental relaxation (Paula, 2000).



**Fig. No. 3 Mentha Oil**

## MATERIALS AND METHOD:-

Soap base, Neem oil, turmeric powder, Lemon peel powder, VitaminEE capsule, Mentha oil, castor oil, Rose water.

## COLLECTION OF SAMPLES:-

Melt and pour glycerine Soap base, Vitamin E capsule. Tree essential oil were collected from the local market. The soap base used was of analytical grade.

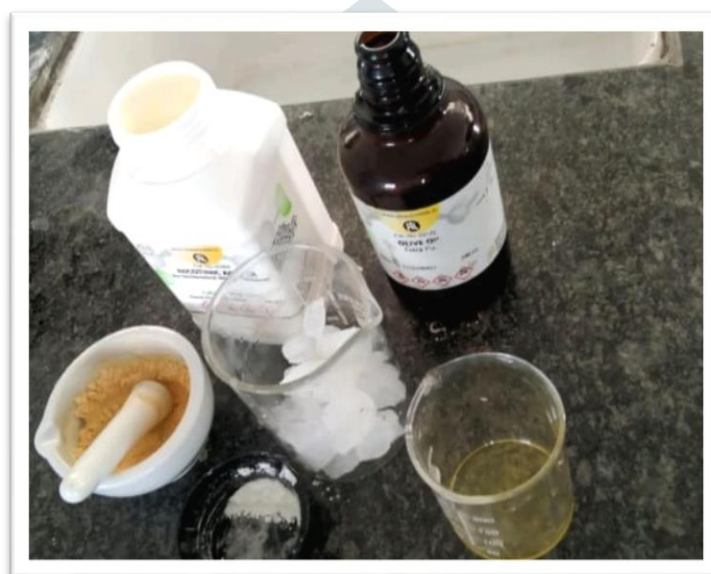
## PROCEDURE:-

Solidified basic 100 gm of glycerine soap base was weighed and broken down into smaller pieces. It was transferred into a steel vessel and then heated in a water bath to melt the soap base and stirred continuously with a glass rod. The lemon peel powder, turmeric powder compositions were added to the base after the soap base was liquefied. The mixture was stirred continuously to avoid lumps. There was continuous agitation with a glass rod for 15 minutes until the molten mixture became Homogeneous. Homogenous mixture was removed from the water bath, and Vitamin E capsule, mentha oil, neem oil and castor oil was added. It was stirred slowly. The semisolid mixture was poured into a mould and allowed to solidify. The soap was allowed to solidify at room temperature until set and kept under physical observation for any characteristic changes.

**Table 1 : Formulation Ingredients of Polyherbal Soap**

Sr. No.	Ingredients	Quantity (%)
1.	Coconut oil	40
2.	Castor oil	35
3.	Neem oil	5
4.	Mentha oil	2
5.	Rose petals extract	0.5
6.	NaOH	2.5
7.	Distilled water	q.s





**Fig. No. 4 Formulation**

#### **EVALUATION OF PHYSICOCHEMICAL PARAMETERS: -**

Various physicochemical parameters were tested to confirm the quality of the formulated soap.

##### **i. Organoleptic evaluation-**

Done by sensory and visual inspection. The naked eye checked the colour and clarity against a white background, and the odour was checked by smelling.

##### **ii. Determination of pH-**

The pH was determined using a digital pH meter.

##### **iii. Foam Height:**

0.5gm of a soap sample was taken and dispersed in 25 ml distilled water. Then, Transferred it into a 100 ml measuring cylinder; the volume was made upto 50 ml with water. Twenty-five strokes were given and stood till the aqueous volume measured up to 50 ml and measured the foam height above the aqueous volume.

##### **iv. Foam Retention:**

25 ml of the 1% soap solution was taken into a 100 ml graduated measuring cylinder. The cylinder was covered with a hand and shaken ten times. The foam volume at 1- minute intervals for 4 minutes was recorded.

**v. Primary Skin Irritation Test:**

Twenty volunteers were selected, and the prepared soap was given them and checked for irritation.

**Vi. Higher Temperature Stability:**

The soap was allowed to stand above 50° Celsius.

**a) Herbs:-**

Family: Meliaceae.

Botanical name: Azadirachta indica.

Parts: Seeds

Chemical constituents: Azadirachtin, Glycerides, polyphenols

Neem oil: It is known as ‘‘margosa oil’’. Pressed from fruits and seeds of neem.

Use: Anti-septic, anti-fungal, anti-histamine.

**b) Rose**

Family: Rosaceae

Botanical name: Rosa Rubiginosa

Rose oil: It is extracted from the petals of various type of roses.

Uses: Nourish, hydrated, heal the skin.

**c) Turmeric**

Family: Zingiberaceae

Botanical name: Curcuma longa

Parts: Rhizomes Chemical

Constituents: Curcumin, Zingiberene

Uses: Anti-bacterial, anti-microbial, anti-septic.

**d) Lemon**

It is astringent in nature and also has antimicrobial and anti-inflammatory properties. These benefits combined make lemon extract a boon in your skincare regime. It reduces inflammation, kills bacteria and also decreases the secretion of excessive oils.

**RESULTS AND DISCUSSION:-**

Many of these soap ingredients are also having Healing power such as aloe Vera, turmeric, and Tulsi. They are rich in natural antioxidant, Antiseptic and antimicrobial properties. The Turmeric plant contains yellow colored Chemical called curcumin, and it is used for a Skin condition called lichen planus, skin Inflammation from radiation treatment and Fatigue skin wounds related to cancer. The Prepared formulation was evaluated for various physicochemical properties and satisfactory results were obtained.

S. No.	Parameters	F1	F2	F3	F4	F5
1	Colour	Paleyellow	Paleyellow	Yellow	Paleyellow	Yellowish brown
2	Odour	Aromatic	Aromatic	Aromatic	Aromatic	Aromatic
3	Shape	Oval	Oval	Oval	Oval	Oval
4	PH	6.6	6.8	6.9	7.0	7.2
5	Foam height	7cm	7cm	7.5cm	8cm	10cm
6	Foam retention	3min	3min 10sec	3min 19sec	3min 25sec	3min 51 sec
7	Irritation	Nonirritant	Nonirritant	Nonirritant	Nonirritant	Non irritant

The above given table describes the colour, odour, shape, irritation, foam height and foam Retention of the poly herbal soap. The colour of all the five formulation were brown. The Odour of all the five formulation was aromatic. The shape of all the five formulation was Oval. As per evaluation test formulation F5 is may be the most standard formulation Compared to other formulation. There is no irritation beside foam retention and foamability of F5 is may be much better than other formulations

### Conclusion:-

The various benefits of herbal soaps make them the ideal choice for better skin care and optimal health outcomes. From scent to therapeutic value and aromatic benefits to medicinal properties, herbal soap heals, soothes, and revives the skin. The prepared polyherbal soap was formulated using cold process technique with antioxidant and anti-bacterial properties. The anti-bacterial and anti-oxidant properties may be exhibit due to presence of Azadirachtin and Amygdalin. The designed formulation F5 A collection of 80gm of soap base, 3gm gel of Aloe barbadensis, and 3ml oil. The further clinical studies of this formulation Have to be done & this formulation by performing the above evaluation parameters we came to a conclusion that. Polyherbal soap possess less chemicals and are more eminent than Synthetic soap. Thus, in this research work, the prepared polyherbal soap possess a wide Variety principles that can be used to improve beauty regime.

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