

# DESIGN, DEVELOPMENT AND EVALUATION OF HERBAL SOAP AGAINST BACTERIAL SKIN INFECTIONS

## Abstract

The aim of the present study was to design and develop an herbal soap by using the melt-and-pour method. Herbal soap has been used traditionally for treating several epidermal dysfunctions, such as eczema, psoriasis, and acne, and helps to boost the immune response in the tissue of the affected skin area. The herbal soap was formulated by using leaves of curry very helpful and does not give side effects. Ayurvedic cosmetics are also known as herbal cosmetics. All herbal ingredients are easily available in the market of surrounding areas. Curry leaves have given more medicinal properties to exhibit antiseptic, antimicrobial, and Anticarcinogenic properties. The results of the selected physical and chemical properties of this study show that all parameters are within acceptable limits. The prepared soap was screened against microorganisms causing skin problems. The microorganisms selected were candida albicans, staphylococcus aureus, and bacillus subtilis. Also, the antimicrobial activity test showed that the designed herbal soap has satisfactory antimicrobial activity, and greater antimicrobial activity shows against candida albicans. Moreover, plants used are added to treat various skin infections. The results show that prepared herbal soap is suitable for human skin use and can be an alternative option for skin problems.

**Keywords:** Herbal Soap, Soap base, Curry leaves, candida albicans, staphylococcus aureus, bacillus subtilis.

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## I. INTRODUCTION

Soap is a salt fatty acid used in variety of cleansing and lubricating products. In a domestic use soap are usually used for the different purposes like washing, bathing and many morehouse holding uses. In industry soaps are used for the purpose of thickening agent, important components of lubricants and precursors for many catalyst. When soaps are used for cleaning purposes, soap solubilizes particles and separated from the article being cleaned. Soap is prepared by mixing fats and oils with a soap base as opposite to that of detergent which is prepared by combining chemicals in one mixture. Humans being used soap for cleaning purposes. Herbal soaps are made from herbal plant mixture and other ingredients that are safe to the skin and less likely to cause any harm. (1)

Natural treatments to offer the best treatment solution for the skin infections and 100% natural herbal soaps prepared by using herbal plant extract beneficial for the skin. The medicinal plants selected in these soaps have medicinal properties and healing activity that offer skin nourishment, and moisturizing properties. These type of herbal soaps also contain coconut oil possesses beneficial effects to the goodness of skin and overall skin health. Herbal soaps are also effective in curing different dermal diseases. Glycerinalong with coconut oil generally not used in commercial soaps. (2) Glycerin helps to retain the moisture in the skin and act as emollient thereby making these soaps dry. Soap helps to remove dirt, slag from skin to keep skin clean and brilliant glow. The main excipients used in material soap are oil and fats. The quality and category of soap is depend on type of the raw components used in soap preparation. (3)

Soap is any water-soluble salt of fatty acid, which contain eight or more than eightcarbon atom. The commonmetal used in soap are sodium and potassium, for water soluble soap that are used in laundry for cleaning purposes. Herbal soap preparation is anherbal formulation contains ant-bacterial and anti-fungal agent which mainly uses of leaves extract of selected plant. (4)

Medicinal plants are natural product found useful in the treatment of all diseases and skin problem due their therapeutic value, cheap, and easy availability. The properties of soap include softens the skin, produces lather, protection against dermal disorder, treatment of skin infection. In comparison to synthetic, herbal treatment has benefits of being cheap and easily available and having minimum side effects.(5)

### **Aim and Objectives:**

- To formulate and evaluate the herbal soap for dermal disorders.
- To promote utilization of coconut oil and plant extract as a raw material for soap making.

## II. MATERIALS AND METHODS

### 1. Plant Used Informulation of Herbal Soaps:

Sr.No	Materials
1	Murraya Koneigii (Murraya koneigii)



**Figure 1:** *Murraya koenigii*

The herb used in formulation is *Murraya koenigii* (Curry) leaves selected on the basis of documented literature. Collection and identification and processing of plant: The leaves of *Murraya koenigii* were collected from different matured plant and plant samples authenticated at Dayanand science college Latur.

- **Extraction:** The *Murraya koenigii* were extracted with water by maceration process. 100 gm of above stated powder was taken in conical flask and extracted with water for 72 hours with occasional agitation then filtered. Obtained filtrate were concentrated on water bath to get semisolid residue. Obtained extract *Murraya koenigii*, was incorporated into a soap formulated with basic glycerin soap. (6, 7)

## 2. *Murraya koenigii* (Curry leaves) and Neem Extraction



**Figure 2:** *Murraya koenigii* leaves extract

### III. EXPERIMENTAL WORK

#### 1. Preparation of basic Glycerin Soap:

Formula of Soap base

Sr. No	Ingredients	Quantity
1	Sodium hydroxide	20gm
2	Coconut oil	50ml
3	Glycerin	10ml
4	Distilled Water	Quantity sufficient

#### 2. Procedure for Basic Glycerin:

- Take sodium hydroxide than add water in that and dissolve it than add glycerin stir it and leave for half hour.
- Take coconut oil heat it and then add sodium hydroxide solution in it. Cook for 5 min.
- Then add water and add to any container leave it for 1 day.



**Figure 3: Soap Base**

- #### 3. Formulation of Herbal *Murraya Koenigii* (Curry Leaves) Soap:
- Murraya* commonly call as curry leaves is an aromatic shrub upto 6 m in height found in India. In traditional system of medicines, it is used as an antiemetic, antidiarrheal, blood purifier flavoring agent in curries and chutneys. (12, 13)

**Formulation Table for Preparation of *Murraya Koenigii* (curry leaves) soap (F3):**

Sr.no	Ingredients	Quantity			Uses
		F1	F2	F3	
1	Soap base	20gm	20gm	20gm	Soap base
2	Curry leaves extraction	0.5gm	1gm	1.5gm	Antiseptic
3	Shikekai	1.5gm	1.5gm	1.5gm	Cleanser
4	Sandal wood oil	1.5 ml	1.5 ml	1.5 ml	Perfume



**Figure 4:** *Murraya koenigii* (curry)

#### IV. EVALUATION TEST OF SOAP

##### 1. Organoleptic Evaluation:

- **Color:** Color was checked by naked eyes.
- **Odor:** The smell of formulation was checked by applying preparation on hand and feels the fragrance of perfume.

##### 2. Physical Evaluation: PH-

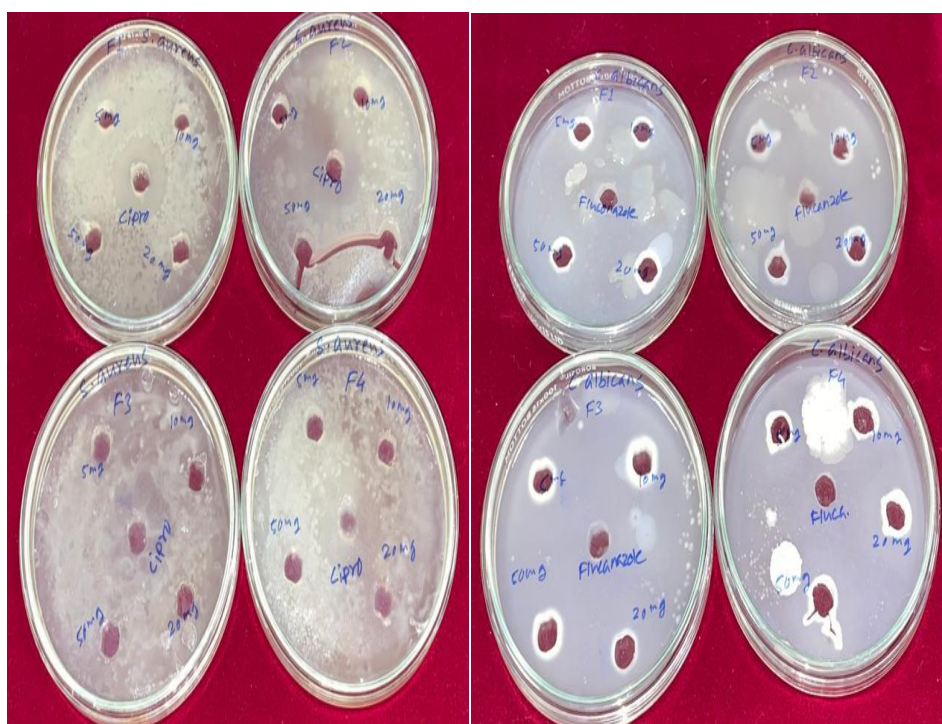
The pH was determined by using pH paper, the pH was found to be basic in nature.

- **Foam Retention-** 25ml of 1% soap solution were taken into a 100ml measuring cylinder and it was covered with palm and rigorously shaken for 10 times. The volume of foam at every 1 minute interval for 4 minute recorded and it was found to be 5 minutes.
- **Foam Height-** for the determination of foam height 0.5 gm of sample soap were taken dispersed in 25ml of distilled water. Then, transferred it in to 100ml measuring cylinder, the volume was make up to 50ml with water. 25 strokes were given and stand still aqueous volume measured up to 50ml and measured the foam height, above the aqueous volume was measured. (8,9)

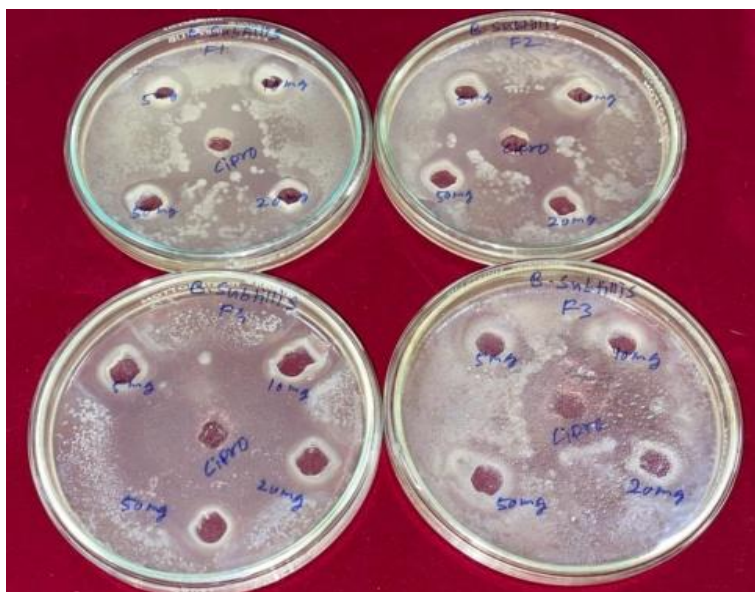
#### Result and Discussion:

Sr. No	Evaluation Test	Murraya Koneigii (curry leaves)
1	PH	7
2	Color	Green
3	Odor	Pleasant
4	Foam height	5.4cm
5	Foam retention	35%
6	Washability	Good washable

**3. Anti-microbial Activity:** For the determination of antimicrobial activity overnight cultures were prepared. The antimicrobial activities of soaps were performed by Agar well diffusion method. Agar well diffusion methods were used to detect antimicrobial activity. The 0.1 ml saline suspension of test microorganisms were inoculated on the surface of sterile Nutrient agar plates. Prepared sample using different concentrations of the prepared soap were aseptically transferred directly into the surface of plates. All inoculated plates were firstly placed in refrigerator for 30 min for diffusion and then incubated at 37<sup>0</sup>C for 24-48 hours and then observed for zone of inhibition. (12)The zone of inhibition was determined by measuring the diameter in millimeters of zone to which the soap inhibited the growth of the organism. The present research investigation was carried out to determine the antimicrobial efficacy of prepared herbal soap of Curry leaf against skin micro flora isolates *Staphylococcus aureus*, *Bacillus subtilis* and *Candida albicans*. Results obtained from the experimental data revealed that prepared soap have antimicrobial activity. We have studied the anti-microbial activity on the bacteria such as *Staphylococcus Aureus*, *Candida Albicans*, and *Bacillus Subtilis* bacteria cause skin infections. (13, 14)



**Figure 5:** *Bacillus subtilis* *Staphylococcus aureus*



**Figure 6: Candida Albicans**

**Antimicrobial activity: Zone of inhibitions**

Sr. No.	Sample(Conc.mg/ml)	<i>Staphylococcus aureus</i>	<i>Bacillus subtilis</i>	<i>Candida albicans</i>
		Zone of inhibition in mm		
1.	<b>F1</b>			
	5	3	5	4
	10	5	8	6
	20	4	8	8
	50	5	9	9
2.	<b>F2</b>			
	5	2	4	6
	10	3	5	4
	20	5	7	7
	50	6	8	8
3.	<b>F3</b>			
	5	3	8	7
	10	5	7	7
	20	5	8	10
	50	6	7	11

Among the different concentrations of herbal soaps, highest concentration of plant extract containing soaps showed highest antimicrobial activity against all pathogen studied. F3 formulation shows highest activity against candida albicans as compared Staphylococcus aureus and Bacillus subtilis. The soaps are cleaning agents routinely used for cleaning purposes. Soaps and detergents exhibit antimicrobial activity by disrupting the microbial cell membrane and also cells proteins. The main aim of this study was to formulate the soap and evaluate its antimicrobial activity.

## V. CONCLUSION

The plant (curry leaves) extract prepared using water and subjected to various preliminary phytochemical test as per guidelines of standardization of herbals. The prepared formulations of herbal soap when tested for antimicrobial activity against different microorganisms shown good results. The soap does not give any irritancy to skin. Furthermore, the prepared herbal soaps were standardized by evaluating various physico chemical properties such as pH, appearance, odor, color, foam height, foam retention and washability in which all prepared soaps exhibit satisfactory effect. The prepared soap shows greater zone of inhibition against selected microorganisms. The soap is routine requirement of life, but it should have good active ingredients or plant extracted material which has the ability to kill bacteria but not to harm body tissues when used constantly.

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