



## **Formulation, Preparation and Evaluation of Orange Peel Powder Herbal Soap**

**Ambekar Wahid, Sangle Sopan\*, Somani Shravan, Bhongal Sakshi, Ahire Sanjivani, Batule Sujata, Bhalsing Harshawardhan, Bhogade Shubham**

Department of Pharmaceutics, Dr. Vithalrao Vikhe Patil Foundation's College of Pharmacy, Vilad Ghat, Ahmednagar – 414111, [MH], India.

\*Corresponding Author's E-mail: [sopansangale2030@gmail.com](mailto:sopansangale2030@gmail.com)

### **ABSTRACT**

*The aim of the present work is to prepare and evaluate orange peel powder soap. The orange peel powder soap was prepared by melt and pour method using soap base, turmeric, vitamin E, Orange peel powder, and rose water. The prepared formulation was evaluated for appearance, pH, foam height, foam retention, color, odor, and alcohol-insoluble substance. The pH of the formulation was checked with pH paper and was found to be 7, i.e., neutral and not irritant to the skin. Foam height and foam retention were determined to be 4.5 cm and 4 min, respectively. Similarly, the formulation was evaluated for Alcohol Insoluble Substances and was found to be 12.6%. The color of the soap is dark brown, and the flavor is orange. It can be concluded that using orange peel powder soap shows excellent cleansing and anti-ageing properties more than glycerin and vitamin E serve as a moisturizer.*

**Keywords:** Herbal soap, Orange peel powder, Turmeric, Rose Oil, Antioxidant.

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### **INTRODUCTION**

A variety of products, such as soap, serve the purpose of cleaning and lubrication by using fatty acid salts. Soaps, which act as surfactants, are commonly utilized for washing, bathing, and various household cleaning tasks. They effectively remove dirt, bacteria, and unpleasant odors from the body. Herbal soaps are prepared with ingredients that possess anti-aging, antioxidant, and antiseptic properties. In contrast to commercial soaps, herbal soaps do not contain artificial flavors, colors, or fluoride [1-5].

Soap is a widely used commodity with a multitude of applications. The increasing range of personal needs and consumer preferences has led to the development of various soap products, including opaque, liquid, and transparent options. Liquid soap is a form of regular soap that is produced in liquid form instead of being opaque or clear. Transparent soap, in comparison to other types, offers gentler foam for the skin and a glossy appearance, making it popular for use on the face and in showers [6-9] [10-14].

Natural soaps are categorized based on production processes such as hot process soap, melt pour soap, and cold process soap. Due to their therapeutic value, cost-effectiveness, availability, and compatibility, herbs are commonly used in the treatment of almost all diseases and skin disorders. The use of chemical soaps today can often lead to dry and irritated skin. However, the popularity of herbal-based soaps is increasing due to their effectiveness in treating skin conditions [15-19].

Soap is composed of a combination of naturally occurring fatty acids and sodium salt. Botanical extracts are now utilized in cosmetic products to enhance appearance and attractiveness. These botanical components impact the skin's biological processes and provide it with the necessary nourishment. Soap is a modern-day cosmetic that helps maintain and enhance the skin's radiance. The importance of cleaning and taking care of one's body using soap was emphasized by Galen, who was among the first to recognize its significance.

### **MATERIAL AND METHODS**

#### **Collection of plant material:**

Orange peel powder (*Citrus sinensis* Linn.), turmeric powder (*Curcuma longa* Linn.), vitamin E containing natural plant source, and rose water (*Rosa gallica* or *Rosa damascene*).

## Formulation table of soap

Table No. 1: Composition of formulation table

Sr. No.	Ingredients	Quantity	Uses
1	Orange peel powder	5 g	Source of Vitamin C, Skin cleanser
2	Soap Base	90 g	Moisturizer and raw material for soap
3	Turmeric	0.5 g	Antioxidant, Anti-Inflammatory
4	Vitamin E	5 Drops	Moisturizer
5	Orange oil	2 ml	Flavoring agent
6	Rose water	3 ml	Reduce skin problem
	Total	100 g	

## Processing for soap

### Melt and Pour Method:

The main advantage of melt and pour soap bases are that they spare users from dealing with lye, a caustic substance already added to the soap base. Another advantage of melt and pour soap bases is that, unlike cold-processed soaps, the finished product does not require a curing period. This means that once melt and pour soaps have been removed from their molds, they are immediately usable after the lye has been neutralized and the saponification process has been completed. The soap will become softer and tougher while it sits. The melt and pour method have become more popular as a result.

For making polyherbal soap, place 90 g of soap base in a 500 ml beaker and heat it in a water bath without stirring while maintaining the desired temperature. The soap foundation will next be transformed into liquid form. Additionally, add orange peel powder (5 g), turmeric (0.5 g), Rosewater (3 ml), Vitamin E (4-5 drops), and Orange oil (2 ml) to the mixture mentioned above. Bring the ingredients to a boil over a water bath to get the right combination without stirring. Then the liquid was poured into the soap moulds, which were then frozen for two to three hours. Remove the soap moulds from the freezer and wait five minutes for the soap to develop after two to three hours. After formulation the prepared herbal soap which is shown in Fig. No. 1.



Fig. No. 1: Final formulation of herbal soap

### Evaluations parameter of prepared soap:

The herbal soap formulated was evaluated for the following:

#### Determining a sample's pH

The pH of the various formulations was determined using a digital pH meter. To measure the pH, the formulations were diluted in 100 mL of distilled water and stored in the refrigerator for a period of two weeks. The pH meter used for measurement had been calibrated beforehand.

#### Irritation of the skin test:

The skin irritancy test was conducted on the composition of the herbal soap. No signs of irritancy or redness were observed in the preparation. The condition was monitored for duration of 24 hours.

#### Washing Capability:

The herbal soap underwent a formulation test to assess its performance and evaluate its ease of washing with water.

#### Foam height:

0.5 grams of soap was dissolved in 100 ml of distilled water, and the remaining 50 ml of water was added to bring the total volume to 50 ml. The height of the foam was measured after 25 strokes.

**Foam ability:**

To assess the foaming ability of the herbal soap, approximately 1 g of the soap was dissolved in approximately 50 ml of distilled water. This mixture was placed in a 100 ml graduated measuring cylinder. The measuring cylinder was then shaken for approximately 10min. After 10 min, the height of the foam produced was measured. This process was repeated for five consecutive experiments

**Foam Retention Time:**

Foam retention time refers to the duration for which the foam produced by the soap remains stable. To determine the foam retention time, the height of the foam was measured for approximately 5-10 minutes after repeating the previously mentioned process.

**RESULT AND DISCUSSION****Organoleptic properties:**

The organoleptic quality of a natural substance refers to its sensory properties, including its appearance, aroma, color, and taste. In the initial stage of the study, these properties are characterized to aid in the primary identification of the natural substance and to determine the likelihood of patient acceptance regarding the aroma, taste, and color of the raw materials. This information also helps in deciding whether these raw materials can be included in the final dosage form. Changes in the color and odor of the raw materials in a formulation may indicate a decline in the formulation's stability under similar conditions. Therefore, a soap formulation that includes a mixture of surfactants is required.

**Determining of pH:**

The pH of all the formulated products was measured using a digital pH meter. The formulations were diluted. Take 1 g of soap sample and dissolve it in 10 ml of water, the result shown in Table No. 2.

**Irritation of the skin:**

The herbal soap formulation underwent a skin irritancy evaluation to assess its potential for causing skin irritation. The results of the evaluation indicated that the soap did not cause any redness or irritation on the skin. The monitoring period lasted for a total of 24 hours. When formulating soap, it is crucial to prioritize the prevention of skin discomfort. The result shown in Table No. 2.

**Washing capability:**

The herbal soap underwent a formulation test to evaluate its cleaning efficacy and how effectively it could be washed off with water. Wool yarn was used as a test material to assess the soap's cleaning activity. While the main objective of a soap is to cleanse and remove dirt or sebum, establishing a standardized method for evaluating its detergency in experiments has proven challenging. This challenge arises from the absence of consensus on a standard soil sample, a repeatable technique for soiling the test material, and the precise amount of soil that the soap should be capable of removing. The result shown in Table No. 2.

**Foam forming ability:**

Foaming ability is determined by using the cylinder shake method. 40 ml of formulation soap solution was placed in a cylinder. It is covered with one hand and shaken 10 times and allowed to stand. After 10 minutes, the height of the foam was measured and recorded. This process was repeated five times, and the mean value was calculated based on the observations. While foam formation is not directly related to the soap's cleansing function, soaps demonstrated identical foaming qualities, with a range of 4-5 cm in terms of foam height. Specifically, the foam height for the formulation was measured to be 4.5 cm. These results are shown in Table No. 2.

**Foam retention time:**

Transfer the 25 ml of the 1 % soap solution prepared into the 100 ml measuring cylinder. The cylinder was then shaken 10 times. In this study, the foam's integrity was measured for approximately 5-10 minutes following the previously described process. Specifically, for the herbal soap composition listed as formulation, the foam retention time was determined to be 4 min. The result shown in the Table No. 2.

Table No. 2: pH test, Skin irritation test, Wash ability test, Foam forming ability, Foam height, and Retention time.

Sr.No.	Parameters	Result
1	pH test	7
2	Skin irritation test	Non-Irritant
3	Wash ability test	Good
4	Foam height	4.5 cm
5	Foam forming ability	Yes
6	Retention time	4 min

➤ The prepared orange peel powder soap has a good appearance with brown color.

- The pH of the formulation was found to be 7, i.e. Neutral.
- Foam height and foam retention were determined to be 4.5 cm and 4 min, respectively.

## CONCLUSION

The orange peel powder herbal soap was prepared with a suitable size, shape, thickness, and weight and good foam-producing ability. The prepared polyherbal soap was formulated by using the melt and pour method. The designed formulation consisting of 90 g, 5 g orange peel powder, 3 ml rose water, 2 ml orange oil, and 4-5 drops vitamin E oil was found to be promising orange peel powder herbal soap with antioxidants, cleansing, and anti-septic, anti-ageing properties. The cleansing property is due to the presence of orange peel powder. The antioxidants and anti-septic properties are due to turmeric. Glycerin and vitamin E serves as a moisturizing agent. The most important thing that polyherbal soap possess is that free from chemicals and more eminent than synthetic soap. It does not cause any irritancy to the skin. The formulation was characterized for different evaluation parameters like colour, odour, size and shape, weight, pH, foaming height, foam retention time, and alcohol insoluble matter, in which they exhibited satisfactory results. The herbal soap showed a good appearance with dark brown with a pleasant smell. The results of evaluation parameters prove that prepared soap has a good appearance, better cleansing, and foaming effect does not have major side effects. The future clinical studies of this formulation can elevate the use of herbal soap.

## CONFLICT OF INTEREST

There is no conflict of interest between authors regarding academic, commercial, financial, personal and professionally relevant to the work.

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