CHAPTER-21

FORMULATION AND EVALUATION OF HERBAL SOAP BY USING LOCALLY AVAILABLE NATURAL RESOURCES

Vaishnavi J. Dahibhat and Vaishali S. Patil

Department of Botany, Shri Shivaji College of Arts, Commerce and Science Akola (MS) 444003 India *Email : dandge.vaishali@gmail.com*

Summary

The majority of commercial soaps include chemicals and synthetic ingredients that may be irritating or even damaging to our skin. Human's skin need special treatment for healing, improvement in skin tone, and appearance of glowing health. The raw material of herbal soap is easily available in nature. Herbal products have double meaning: first they are used as cosmetics for skin care and second the presence of photo-chemicals and botanicals in them, which result natural healthy skin.

Indian herbs are the most abundant source utilised in the cosmetic industry. As more people know the health benefits and cost effectiveness of herbal products, there use is growing rapidly all across the world. Skin diseases occur all over the world at significant levels. They have been identified as a public health problem in developing countries & are dominated by bacterial, fungal infections. Dermatitis neglecta is a skin condition can occur when a person does not or cannot thoroughly wash & exfoliate the skin. These diseases may cause rashes, inflammation, itchiness or other skin changes.

Herbal soaps are made using natural herbs and ingredients that are healthier and beneficial for the skin as well as gave benefits for entrepreneur. Some of the natural soap manufacturers also use aroma therapy and herbal treatments to offer the best skin treatment solution for our skin. Natural soaps are made up of natural ingredients and found to be highly beneficial for the skin. The aim of our study is to develop the herbal hygienic soap using an antimicrobial ingredient such as Neem, Tulsi, Aloe-vera, Turmeric, Coconut oil, Rose water etc. The herbal formulation is prepare and evaluated for the analysis of pH, moisture content, foaming index, foam retention time, and high temperature stability. Keyword: Botanical products, formulation, evaluation.

Introduction

The skin is the body largest organ and its exposure to the environment makes it vulnerable to a wide range of skin disease. In our daily life we used chemically synthesized products or cosmetics such as parabens, formaldehyde and phthalates. These products are very harmful for our skin. These products causing various skin diseases. In order to avoid skin problems, it is important to keep the body largest organ, clean and free of any microbes that could be floating about outside.

Soap making is an ancient craft. Prehistoric people may have discovered soap when fat and ash met and saponified as they cooked over open pits. A soap manufactory was uncovered in the ruins at Pompeii, and the Greek physician Mr. Galen wrote about soap in the second century. It is hard to believe that as recent as the last century, soap had to be labelled as to it is use. Also during this time, soap fell out of popularity as some modest Victorians believed "soap baths" as disgraceful and sinful.

Skin care herbal soap formulation fight fungi, bacteria and microbes may be made from any number of plant components, including the stem, leaves, roots, bark, flower and fruit. Herbs are the most commonly used natural items to cure all disease and skin problems due to there great medicinal value, low cost and availability. It not only addresses skin infections like ringworm but also promotes smoothness, even tone, and overall tenderness for our skin. The herbs used were *Azadirachta indica, Aloe barbadensis, Curcuma longa, Rosa* sp., *Moringa oleifera, Murraya koenigii, Citrus sinensis*, etc.

The use of natural treatment is more common in developing world. Herbal soaps are in more demand than their synthetic count parts for a variety of reasons including natural components, moisturizing properties, aromatherapy benefits, minimal adverse effects, enhanced safety and effectiveness, easily accessible, improved compatibility with other ingredients, significant curative effect, increased tolerability for all skin tones & cost effective.

Stress in the skin, which has been associated with delaying the aging process. Herbs and essential oils that are used in the herbal product should not be intended to penetrate beyond the superficial layer of the skin. The inclusion of extracts in topical formulations can minimize oxidative

Herbal soaps possess significant therapeutic value as they harness the power of natural herbs, which are widely employed in the treatment of various ailments and skin conditions value, affordability, accessibility, and compatibility. The global market for herbal cosmetics is experiencing a rapid increase in demand, showcasing the priceless treasures bestowed upon us by Mother Nature.

The herbs used for preparation of soap has significant properties such as, neem leaves reduce uneven skin tone and protect our skin, Haldi reduce inflammation, brightening skin and treating acne, Rose petals helps soothe irritation, reduce redness, fight acne, hydrate skin, minimize wrinkles, Moringa

170

leaves helps with antiaging, acne and skin barrier protection, Orange peel helps tighten pores, control excess oil production and provide a refreshing sensation.

Materials and Methods

Preparation of soap base

- Take 75 ml Coconut oil put in hot water bath stir it boil it until a strong consistency formation at temperature between 40-45°C.
- Take 13.20 gm sodium hydroxide dissolve in 24 ml distilled water, mixed it and add in coconut oil mixture. Boil at 40-45°C.

Soap for combination skin	Soap for dry skin	Soap for oily skin	Soap for hairs	
Orange peel soap	Rose petals soap	Neem Soap	Shikakai Soap	
1.Orange peel	1. Rose petals extract-	1.Neem leaves	1.Shikakai	
extract-10ml,	10ml	extract-10ml	powder-2gm,	
2.Glycerine-5ml,	2. Glycerine-5ml,	2.Vitamin E-1gm,	2.Curry leaves	
3.Coconut oil-5ml,	3.Coconut oil-5ml,	3.Rose water-2ml,	extract- 2ml,	
4.Aloe vera gel-5gm,	4. Aloe vera gel-5gm,	4.Essential oil	3.Coconut oil-	
5.Vitamin E-1gm,	5. Vitamin E-1gm,	(Mogra)-0.5ml,	5ml,	
6.Essential oil	6.Essential oil (Rose)-	5. Soap base-30gm.	4. Aloe vera gel-	
(Mogra)-0.5ml,	0.5ml,		5gm,	
7. Soap base-30gm.	7. Soap base-30gm.		5.Soap base-	
			30gm.	
Moringa Soap	Haldi Soap		-	
1.Moringa leaves	1.Haldi powder-			
extract-10ml	0.5gm,			
2.Glycerine-5ml,	2.Glycerine-5ml,			
3.Coconut oil-5ml,	3.Coconut oil-5ml,			
4.Aloe vera gel-5gm,	4.Aloe vera gel-5gm,			
5. Vitamin E-1gm,	5. Vitamin E-1gm,			
6.Essential oil	6.Essential oil			
(Mogra)-0.5ml,	(Mogra)-0.5ml,			
7. Soap base-30gm.	7. Soap base-30gm.			

Table 1: Preparation of soaps

Details of Soap preparation

• Orange peel soap - Take 10 ml of orange peel extract in a beaker then add 5ml of glycerine, 5ml of coconut oil, 5gm of aloe vera gel, 1gm vitamin E and 0.5ml essential oil then all are mix 2 to 3 minutes. The soap base was taken in a beaker and was melted in a hot water bath. After melting the mixture of orange peel extract and ingredient was added in soap base and stir continuously. It was poured in a soap mould and cooled for 15 minutes.

- Moringa soap Take 10ml of moringa leaves extract in a beaker then add 5ml of glycerine, 5ml of coconut oil, 5gm of aloe vera gel, 1gm vitamin E and 0.5ml essential oil then all are mix 2 to 3 minutes. The soap base was taken in a beaker and was melted in a hot water bath. After melting the mixture of moringa leaves extract and ingredient was added in soap base and stir continuously. It was poured in a soap mould and cooled for 15 minutes.
- Rose petal soap Take 10ml of rose petal extract in a beaker then add 5ml of glycerine, 5ml of coconut oil, 5gm of aloe vera gel, 1gm vitamin E and 0.5ml essential oil then all are mix 2 to 3 minutes. The soap base was taken in a beaker and was melted in a hot water bath. After melting the mixture of rose petal extract and ingredient was added in soap base and stir continuously. It was poured in a soap mould and cooled for 15 minutes.
- Haldi soap Take 0.5gm of haldi powder in a beaker then add 5ml of glycerine, 5ml of coconut oil, 5gm of aloe vera gel, 1gm vitamin E and 0.5ml essential oil then all are mix 2 to 3 minutes. The soap base was taken in a beaker and was melted in a hot water bath. After melting the mixture of haldi powder and ingredient was added in soap base and stir continuously. It was poured in a soap mould and cooled for 15 minutes.
- Neem soap Take 10ml of neem leaves extract in a beaker and add 1gm vitamin E, 2ml of rose water, 0.5ml essential oil then all are mixed 2-3 minutes. The soap base was taken in a beaker and was melted in a hot water bath. After melting the mixture of neem leaves extract and ingredient was added in soap base and stir continuously. It was poured in soap mould and cooled for 15 minutes.
- Shikakai soap Take 2gm of shikakai powder in a beaker and add 2ml of curry leaves extract, 5ml of coconut oil and 5gm of aloe vera gel then all are mix 2-3 minutes. The soap base was taken in a beaker and was melted in a hot water bath. After melting the mixture of shikakai powder and ingredient was added in soap base and stir continuously. It was poured in soap mould and cooled for 15 minutes.

Evaluation of soaps to verify the efficacy and quality of the final formulation

Physicochemical characteristics

- a. Colour (by using white background)
- b. Aroma, (Inhaling a direct sample by 5-6 different people)
- c. pH (Prepare 1% of the sample for determination of pH and prepare a buffer solution of pH 4 and pH 7. Calibrate pH meter and then measure the pH of sample solution and record the pH of the sample solution.)

- d. Shape (By sensory and visual examination.)
- e. Dirt dispersion test (Prepare 1 % sample solution add 2 drop of ink and then shake 10 times found dirt in water and ink in foam.)
- f. Wetting time test (Take piece of cotton fabric, cut into disc shake shape with diameter of one inch and then measure sample weight. Prepare a 1% sample dilute it as well as a piece of cotton cloth to lay on top of the sample. The disc made of fabrics was allowed to float freely on top of the 1% sample solution.)
- g. Foam forming ability (Take 100ml measuring cylinder add 50ml of 1% sample solution shake it 10 times. After shaking for 1minute measure the hight of the foam and record total volume of foam.)
- h. Foam stability test (Take 100ml measuring cylinder add 50ml of 1% sample solution and then cover up cylinder by hand then shake it 10 times and calculate the value.)
- i. Moisture content (Take 10gm of material and heat it in a hot air oven at 100 to 105°C for an hour and weight it.
- j. Here, the moisture content formula :
- k. Moisture content = (Difference in weight/initial weight) \times 100),
- 1. Skin irritation test (For the determination of irritancy test, use soap sample on clean skin to observe for sign of irritation such as redness, burning or itching and 24 hours, the situation was monitored.)

Result and Discussion

Evaluation of prepared soaps – In order to verify the efficacy and quality of the final formulation, the following physicochemical characteristics were tested such as colour, aroma, shape, pH, dirt dispersion test, foam forming ability, wetting time test, foam stability test, moisture content, skin irritation test. The results of physicochemical characters are mention in following table,

Physicoche mical characteris tics	Orange peel soap	Moringa soap	Rose petal soap	Haldi soap	Neem soap	Shikakai soap
Colour	Turmeric yellow	Pastel green	Golden yellow	Mustard yellow	Dark green	Brown
Aroma	Character istics	Character istics	Character istics	Character istics	Character istics	Character istics
Shape	Elliptical	Elliptical	Elliptical	Elliptical	Elliptical	Elliptical
pH	7.08	7.06	8.01	8.46	8.47	8.06

Table - 2: Evaluaton of prepared soaps

Dirt dispersion test	Normal	Normal	Normal	Normal	Normal	Normal
Wetting time test	10.01 min.	9.07 min.	10.50 min.	10.47 min.	10.35 min.	9.40 min.
Foam forming ability	5 cm	5.2 cm	5.9 cm	5.8 cm	4.8 cm	8.0 cm
Foam stability test (After10 min.)	1 cm	0.7 cm	0.8 cm	1.3 cm	1.0 cm	1.8 cm
Moisture content	3.3 %	3 %	3.4 %	2.9 %	3.1 %	2.7 %
Skin irritation test	No	No	No	No	No	No

Details of Evaluation of prepared soaps

- The colour of orange peel soap is turmeric yellow, moringa soap is pastel green colour, rose petal soap is golden yellow colour, haldi soap is mustard yellow colour, neem soap is dark green colour and shikakai soap is brown colour.
- The aroma of all type of soaps are characteristics.
- The shape of all type of sopas are elliptical.
- The pH of orange peel soap is 7.08, moringa soap is 7.06, rose petal soap is 8.01, haldi soap is 8.46, neem soap is 8.47, and shikakai soap is 8.06.
- The dirt dispersion test of all type of soaps are normal.
- Wetting time test of orange peel soap is 10.01minute, moringa soap is 9.07 minute, rose petal soap is 10.50 minute, haldi soap is 10.47 minute, neem soap is 10.35 minute and shikakai soap is 9.40 minute.
- The foam forming ability of orange peel soap is upto 5cm, moringa soap is upto 5.2cm, rose petal soap is upto 5.9cm, haldi soap is upto 5.8cm, neem soap is upto 4.8cm and shikakai soap is upto 8.0cm.
- Foam stability test of orange peel soap is upto 1cm, moringa soap is upto 0.7cm, rose petal soap is upto 0.8cm, haldi soap is upto 1.3cm, neem soap is upto 1.0cm and shikakai soap is upto 1.8cm.

- The moisture content found in orange peel soap is 3.3%, In moringa soap is 3%, rose petal is 3.4%, haldi soap is 2.9%, neem soap is 3.1% and shikakai soap is 2.7%
- There is No skin irritation in all type of soaps.



Fig. 2: Prepared herbal soap

Conclusion

The preparation of herbal soap is a simple process that involves melting a highquality soap base, adding herbal ingredients, pouring into melds, and allowing it to cool and harden. The resulting soap is a nontoxic, gentle, and effective cleanser that can nourish the skin, improve complexion, and promote overall well-being.

The prepared soap when tested for different test gave good result. It does not give any irritancy to skin when it was tested by few volunteer hence; it is proved that soap does not give any side effect to skin. These soaps are made up of freely available constituent in nature. It is eco-friendly, gentle on skin good for sensitive skin, antioxidant rich, promotes sustainable living, maintain hand crafted quality, better for allergy sufferers, preserves natural resources and contain non-toxic alternatives.

Government should supports small farms and business and promote local manufacturing because natural herbal soap minimize water as well as soil pollution. Herbal soap production provides the job opportunities and boost socio-economic condition of farmers and non-employed youth. 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.

References

- [1] Afsar, Z., Khanam, S. and Aamir, S. (2012). Formulation and comparative evaluation of polyherbal preparation for their disinfectant effects, 1(1).
- [2] Ahmed, Latif., Hazarika, M. U., Sarma, D. Formulation and evaluation of an ayurvedic bath soap containing extracts of three ayurvedic herbs. *Journal of Medicinal Plants.* 2021; (2): 115-117.

- [3] Akuaden, N., Jeremiah, I. Y., Chindo, J. (2019). Formulation, Physicochemical and Antifungi Evaluation of Herbal Soaps of *Azadirachta indica* and *Ziziphus mauritiana*. IOSR Journal of Applied Chemistry. 12(8): 26-34.
- [4] Bhalekar, M. R., Padher, S., Ashwini, M., Madgulkar, R. (2017). Evaluation of aqueous extract of Soapnut as surfactant in cosmetics. *J Pharmacogn Phytochem*, 6(4): 1318-20.
- [5] Londhe, J., Jagtap, S. D., Doshi, C., Jagade, D. (2015). Formulation of Herbal Wash with Potential Antimicrobial Activity. *International Journal of Research in Advent Technology*, 31: 11-14.
- [6] Majekodunmi. S. O/, Essien. A. A. (2014). Development and evaluation of antimicrobial herbal formulations containing the methanolic extract of *Cassia alata* for skin disease, *Journal of Coastal Life Medicine*, 2(11): 872-875.
- [7] Nasrul, T., Ani, H., Nia, Y. (2018). A Review on Herbal Cosmetics In Indonesia. *International Journal of Applied Pharmaceutics*, 10: 5
- [8] Rafiq, Shahina S. J. (2021). Formulation of herbal soap against acne causing bacteria. *Asian J Biol Life Sci.* 10(3): 609
- [9] Ruckmani, K., Krishnamoortthy, R., Samuel, S., Kumari, H. L. (2014). Formulation of Herbal Bath Soap from *Vitex negundo* Leaf Extract. *Journal of Chemical and Pharmaceutical Sciences*, 13(2): 95-6.
- [10] Seetha Devi, A., Sivani, D. V., Anusha, D., Sharath, G. and Syed Meraj Sultana (2021). Formulation and Evaluation of Antimicrobial Herbal Soap. Int. J Pharm. Sci. Rev. Res. 71(2): 122-125.
- [11] Shah, R. R, and Vakharia, R. R. (2020). Formulation and Evaluation of Antifungal Soap Soap of Garlic Oil. Asian Journal of Pharmaceutical Research, 10(1): 13-16.
- [12] Sharma, A., Yadav, R., Guha, V., Soni, U. N., Patel, J. R. (2016). Formulation and Evaluation of Herbal Hand Wash. World Journal of Pharmacy and Pharmaceutical Science, 5(3): 675-683.
- [13] Shivanand, P., Nilam, M., and Viral, D. (2010). Herbs play an important role in the field of cosmetics. *International journal of Partech Research*, 2(1): 632-635
- [14] Wulandari, Rima, Nugraheni, I. K., Kiptiah, M. (2023). Betel leaf extract as an antibacterial agent in solid soap formulation and characteristics. *Journal Pijar Mipa*. 18(3): 436-441.
- [15] Zaman, S. U., Akhtar, N. (2013). Effect of Turmeric Extract Cream on Human Skin Sebum Secretion. *Tropical J Pharm Res*, 29(5): 665-669.

