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Research Article

Formulation and Evaluation of Polyherbal Soap

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Abstract

The aim of the study is to formulate and evaluate Polyherbal soap using coconut oil, beeswax, NaOH(lye), Glycerine, Neem, aloe vera, Turmeric, Tulsi, Sandalwood powder, orange peel powder, Multani mitti, Reetha, Honey and Vitamin E capsule. The herbal formulation was prepared then evaluation of the analysis of Physical parameter, pH, Foam height, Foam retention time, Moiture content, Alcohol insoluble matter etc. Various study found that, these herbal plant extract proven to anti-bacterial activity, anti-inflammatory activity, anti-fungal activity etc. The finding for the herbal soap reveals that these soaps are cost effective, convenient, natural foam generate on application, not exhibit any skin irritation and less or no side effect.

Keywords: Polyherbal soap, Neem, Aloevera, Turmeric, Moisture content.

INTRODUCTION:

According to a study performed by the World Health Organization, more than 80% of the population depends on conventional remedy for their key healthcare needs [1]. The word "cosmetic" comes from the Greek word "kosm tikos," which means having the ability to plan and decorate [2]. The origin of cosmetics forms a continuous narrative throughout the history of man as they developed. The man in prehistoric times 3000BC used colors for decoration to attract the animals that he wished to hunt and also the man survived attack from the enemy by coloring his skin and adorned his body for protection to provoke fear in an enemy (whether man or animal) [3]. 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 [4]. 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 [5].

Skin: Skin is very important for all health care professionals to have basic information about the structure and function of human skin. Skin is also called cutaneous membrane. In adults the skin has a surface area ranging from 1.2 to 2.2 m [2]. Skin has two types, hair -bearing skin that covers much of the body and hairless skin as that of palms of hands and soles of feet [6]. The skin provides some protection from the sun, pollution, and viruses, it is the most vulnerable portion of the body [7].

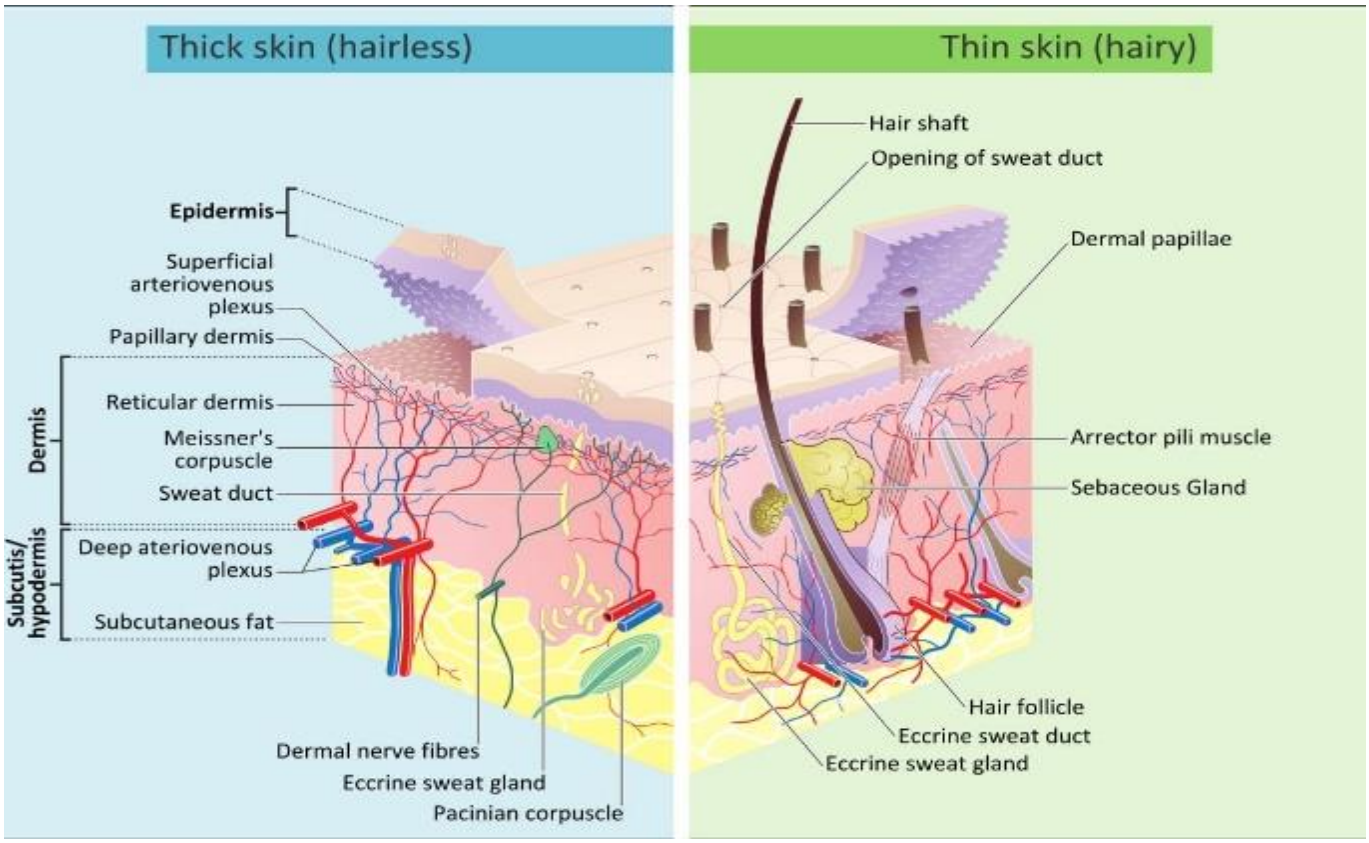

Figure 1: Skin Component [6]

Skin types and their care:

The skin is classified into 4 groups and for class appropriate ingredients should be used to maintain its natural functionality [8].

Table no. 1

Skin type	Features	Herbs	Essential oils
Oily skin	1. Shinyand often has breakouts. 2. Coarse pores and pimples	Aloe Vera, Thyme, Lemon grass,	Bergamot, Lavender, Juniper
Dry skin	1. A feeling of skin tightness. 2. Fine lines.	Aloe Vera, olive oil, calendula	Chamomile Fennel, Geranium, Lavender
Combination skin	1. Oily skin on the forehead, shine, Blackheads. 2. Dullness and fine lines on cheeks.	Witch Hazel, Menthol, Aloe Vera, Turmeric	Citrus oils, jasmine oil,sandal wood oil
Normal skin	1. Neither oily nor dry 2. Appears smooth	Pomegranate, Herbal face pack, Gingili oil	Chamomile Fennel, Geranium,Lavender, Sandal wood

Herbal soap:

Soaps are carboxylate salts with very long hydro carbon chains. Soaps can be made from the base hydrolysis of a fat or oil. It is used as a surfactant for washing, bathing and cleaning but used in textile spinning for lubricants saponification is the process in making the soap by reaction of triglyceride fats are hydrolyzed into free fatty acids then it will combine with alkali to forming crude soap [9]. Herbal soaps are also effective in curing different skin problems [10]. Herbal soap preparation uses plant parts such leaves, roots, seeds, rhizomes, and nuts to treat diseases and promote health. It is a medicine having antibacterial, anti-aging, anti-oxidant, or anti-septic properties. As compared to the content of commercial soap, herbal soap does not contain artificial colors, flavors, fluorides, etc. herbs are natural items that are typically used in the treatment of almost all diseases and skin conditions [11]. Soaps are used for staying fresh and for hygienic purposes but after effect of using chemical soap is dry skin, skin damage and skin allergies [12].

MATERIAL:

The herbal plant material were collected from the local market. The Tulsi and honey were collected from natural in local area. While the chemical and reagents apply from Shri Swami Samarth Institute of Pharmacy, Dhamangaon rly. Amaravti.

Table no. 2

Sr. No.	Material	Uses
1.	NaOH	Lye solution
2.	Coconut oil	Lather enhancer
3.	Beeswax	Harding
4.	Glycerine	Solvent
5.	Neem	Anti-bacterial agent
6.	Aloevera	Moisturizer, antifungal
7.	Tulsi	Anti-bacterial & Anti-fungal agent
8.	Turmeric	Antibacterial & Anti-ageing agent
9.	Orange Peel	Reduce skin marks, Help to skin whitening
10.	Sandalwood	hydrate the dry and aging skin
11.	Multani mitti	Remove oil from skin
12.	Reetha	Surfactant
13.	Honey	Good for wrinkles Prevent acne
14.	Vitamin E	Anti-oxidant
15.	Steric acid	Hardness

Formulation and Method:

Preparation of polyherbal soap Herbal soap were prepared by moulding method and the various formulae used in the study are shown in the table.

Table 3:

Sr. No.	Ingredients	F1	F2	F3
1.	NaOH	7g	8g	7g
2.	Coconut oil	35ml	35ml	35ml
3.	Beeswax	20g	10g	15g
4.	Glycerin	9ml	5ml	5ml
5.	Aloe Vera	2g	2g	5g
6.	Neem	2g	2g	2g
7.	Tulsi	3g	2g	1.5g
8.	Turmeric	0.2g	0.5g	0.5g
9.	Sandalwood powder	1.5g	2g	1.5g
10.	Orange Peel	-	1g	1.5g
11.	Multani mitti	1g	2g	1.5g
12.	Reetha	0.5g	0.5g	0.5g
13.	Honey	3g	4g	3g
14.	Vitamin E	-	5 capsules	2 capsules
15.	Steric acid	0.5g	1g	0.5g
16.	Rose Oil	q.s	q.s.	q.s
17.	Distilled water	40ml	50ml	50ml

Method of preparation of poly herbal soap:

Step 1: Prepare Lye Solution

Weigh 7g of NaOH (Sodium Hydroxide) and add it to 50ml of Distilled water in a heat-resistant mixing bowl. Stir carefully until NaOH dissolves completely.

Step 2: Prepare Herbal Infusion

Mix 5g of Aloe Vera powder, 2g of Neem powder, 1.5g of Tulsi powder, 0.5 gm of Turmeric powder, 1.5 gm of

Sandalwood powder, 1.5g of Orange peel powder, 1.5g of Multani Mitti powder, and 0.5g of Reetha powder in a small bowl.

Step 3: Prepare oil blend

Weigh 35ml of Coconut oil and 15g of Beeswax in a separate heat-resistant mixing bowl.

Heat the mixture in a double boiler/ Water-bath until the Beeswax melts.

Step 4: Mix Lye Solution and Oil Blend

Slowly add the lye solution to the oil blend and mix until saponification occurs (approx. 10-15 minutes).

Step 5: Add Herbal Infusion and Other Ingredients

Add the herbal infusion mixture to the soap mixture and blend well.

Add 5ml of Glycerine, 3g of Honey, 2capsule of Vitamin E oil, and 0.5g of Steric Acid to the soap mixture and blend well.

Add a few drops of Rose oil for fragrance.

Step 6: Pour into Mold and Cure

Pour the soap mixture into a soap mold and allow it to cool and harden.

Remove from mold after 24 hours.

Cure the soap bars for 2-4 weeks to allow excess moisture to evaporate.

Evaluation test of herbal soap:

Prepared formulation of Poly herbal soap was subjected to following evaluation parameters:

1. Physical parameters:

Like colour, odor, texture was carried out Colour and texture were evaluated by visual and touch sensation respectively. The Odour was inspected by sensing the formulation.

2. PH:

10gm of Sample of soap was taken and dissolved it into 100ml distilled water. The pH solution was measured by standardized digital pH meter.

3. Skin irritation:

Skin Irritation Test was evaluated by applying Polyherbal soap on skin and left for 30 min, after 30 minutes of washing observe any itching, rashes or redness on skin by sensory and visual inspection.

4. Foam height:

0.5 g of sample of soap was dispersed in 25 ml distilled water. Then, transferred it into 100 ml measuring cylinder and the volume was made up to 50 ml with water. Twenty-five strokes were given and allowed to stand till aqueous volume measured up to 50 ml and the foam height above the aqueous volume was measured.

5. Foam retention:

About 1% soap solution was prepared and from this, 25 ml was taken in a 100 ml measuring cylinder. The cylinder was covered with hand and shaken for 10 min. The volume of foam at 1 min intervals for 4 min was recorded.

6. Alcohol insoluble matter:

In a conical flask, 5 g of sample was taken. To this, 50 ml of warm ethanol was added and it was shaken vigorously, until the sample was dissolved completely. The solution was filtered through a tared filter paper along with 20 ml warm ethanol and dried it at 105°C for 1 h. The weight of dried paper was noted.

7. Moisture content:

A sample of the 10g scrapped soap was put into a petri dish and placed in an oven for 1 hour at 110°C. It was allowed to cool down and then weighed. The moisture content in percentage was calculated.

Evaluation Parameter:

Table 4:

Sr. No.	Test	F1	F2	F3
1.	Colour	Yellowish	Brown	Light Brown
2.	Odor	Characteristics	Characteristics	Characteristics
3.	Texture	Cake form	Smooth	Smooth
4.	Shape	Oval	Oval	Oval
5.	PH	9	7.5	7.4
6.	Skin Irritation	No Irritation	No Irritation	No Irritation
7.	Foam Height	4.7	5.9	8
8.	Foam Retention Time	3 min	3 min	3 min
9.	Moisture Content	21.4%	3.8%	7.6%
10.	Alcohol Insoluble Matter	9.6%	6%	7.6%

RESULT AND DISCUSSION:

The present work is concerned with the formulation of soap using extract of Polyherbal plant. The formulated Poly herbal soap was a dry, stable solid showing no color change and good appearance and is foamy in nature without any added surfactants. The soap was formulated by adding minimal additives to achieve effectiveness, with cost effective benefits and no side effects.

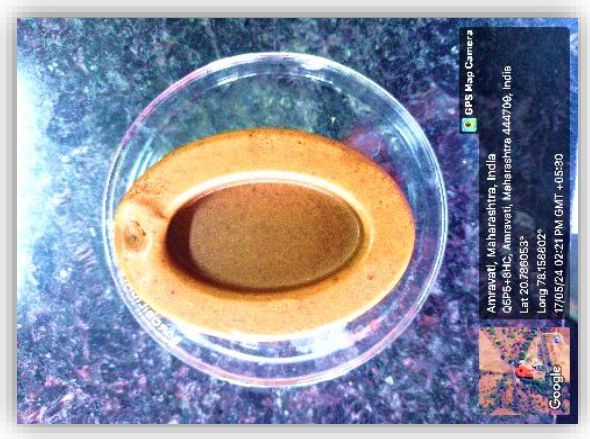

Figure 2: Herbal Soap

Based on the test results, considering a balanced formulation, F3 seems to be the best batch due to:

1. Balanced NaOH (7g) and steric acid (0.5g) for gentle cleansing.

2. Moderate beeswax (15g) for texture and stability.

3. High Aloe Vera (5g) for hydration and soothing benefits.

4. Balanced Multani mitti (1.5g) for detoxification

5. Turmeric (0.5g) and neem (2g) for anti-inflammatory benefits.

6. Sandalwood powder (1.5g) and rose oil (q.s.) for soothing aroma.

7. Vitamin E (2 capsules) for antioxidant benefits in formulation.

8. pH (7.4): Closest to skin's natural pH, reducing irritation risk.

9. Foam Height (8): Highest, indicating better cleansing ability.

10. Moisture Content (7.6%): Balanced, providing hydration without greasiness.

11. Alcohol Insoluble Matter (7.6%): Moderate, indicating a balanced formulation.

12. No skin irritation.

As Comparison to F1 and F2 batch:

- F1:

  - High pH (9) may cause irritation.

  - Low foam height (4.7).

  - High moisture content (21.4%) may feel greasy.

- F2:

  - Low moisture content (3.8%) may be drying.

  - and high steric acid (1g).

  - Lower foam height (5.9) compared to F3.

CONCLUSION:

The present work involves the formulation of herbal soap by using coconut oil base. Literatures regarding herbal soap form preparation, herb and excipients selection, preparing method etc., has been collected and reviewed. based on the optimization of the parameters concluded that herbal soap can be prepared by soap base and Neem, Turmeric, Tulsi, aloevera, orange Peel, multani mitti, Sandalwood powder, Vit. E., rose oil Glycerin, Beeswax. There were three formulation F1, F2 and F3. The evaluation was done for all these formulations. From these F3 shows all the evaluation parameters satisfied for herbal soap like shape, color, odour, best balance of ingredients, pH, and performance, making it suitable for sensitive skin, effective cleansing, balanced hydration, Anti-inflammatory and antioxidant benefits.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Ethics approval and consent to participate: Not applicable

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