

FORMULATION AND EVALUATION OF POLY HERBAL SOAP

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ABSTRACT

Background: The need to achieve and maintain healthy skin is on the rise. This causes the composition of antioxidant soaps with complex synthetic chemicals whose safety on skin and human health is still unclear. **Objectives:** The present work involves the formulation and evaluation of poly herbal soaps. **Methods:** The herbal soaps were formulated using *Azadirachta indica*, *Prunus communis* Linn, *Aloe barbedensis*, *Curcuma longa* and evaluated for various properties like colour, odour, pH, foam retention (Fr), foam height (Fh). **Results:** Polyherbal soap F5 gave the most stable foam with over 3 minutes and 45 seconds foam retention when small amount of soap was dissolved in distilled water. The results of the formulated soaps, reveal that formula containing only one show less significant activity than formula with two or more combined. **Conclusion:** The results of the study offer potential alternative to the cosmetic industry in polyherbal soap production.

KEYWORDS: Antioxidants, Moisturizer, Herbal soap.

1. INTRODUCTION

1.1 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 m². 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.^[1] Skin is the most exposed part of the body to the sunlight, environmental pollution and also used to some protection against the pathogen.

1.1.1 Most common skin disease

Most common skin diseases are Eczema, Acne, Rashes, Psoriasis, Allergy, dry skin, urticaria etc.

1.2 Soap

Soap is a salt of fatty acid used in a variety of cleansing and lubricating products. Soaps are surfactant usually used for washing and bathing and other types of housekeeping.^[2] Soaps are used to remove dirt including dust microorganism, strains bad smells from the body.^[3] Commercial soap usually are made up of toxic mercury aluminium, barium, bis-phenol, plastics and other chemicals, which are absorbed into the body via internal organs from vaporization of the chemicals as well as skin absorption with negative side effects.^[4]

1.3 Herbal soap

Herbal soap preparation is a medicine it contain anti-bacterial, anti-ageing anti-oxidant, anti-septic properties which mainly uses of part of plant like seeds, rhizomes, nuts and pulps to treatment for an injury or disease or to achieve health.^[5] Herbal soap do not contain the artificial colours, flavours, fluorides etc., when compared to the content of commercial soap.^[6] Herbs are the natural products mostly found in the treatment of almost all diseases and skin problems owing to their high medicinal value, cost effective ness, availability and compatibility.^[7]

Azadirachta indica is one the best trees in India, which known for its medicinal properties. In fruits and seeds are the source of neem oil. It is used to treat most few common problems that the people face.^[8]

The *Aloe vera* has been known and used for centuries for its health, beauty, medicinal and skin care properties. Nowadays most frequently aloe vera used in the field of cosmetology. Aloe vera contain 75 potentially active constituents.^[9]

Curcuma longa having properties like photo protection, anti-ageing, anti-wrinkle, moisturizing, Anti-oxidants, astringent, anti-microbial and anti-inflammatory activity. Recent studies demonstrate that the curcumin is excellent for wrinkles and can control the inflammation and the formation of free radicles.^[10]

In recent studies a growing interest in biology and medicine has been focused on oxidative stress from the view point of its participation in several disease such as cancer, ageing and arteriosclerosis.^[11]

Almond oil has been used for hundreds of years to treat dry skin conditions, including eczema and psoriasis. The oil may reduce the appearance of acne, enhance cell development and reverse sun damage.^[12]

During COVID -19 pandemic the frequent and increased use of synthetic hand washing products may result in cellular damage. Using synthetic components in soap has caused severe health concerns for human and the

ecosystem. So the poly herbal soap formulated from natural sources to reduce the environmental effect and improve public health.

2. MATERIALS AND METHODS

2.1 MATERIALS

Collection of active ingredients were collected from different manufacturing company and local market. Neem oil - Morpheme remedies Pvt.Ltd. Almond oil purchased from Oilex. S.A, Rose water purchased from Vishal personal care Pvt.Ltd. Aloe Vera gel purchased from Essentially yours Pvt.Ltd. Multan clay and turmeric are obtained from local market.

2.2. PHARMACOGNOSTICAL PROFILE OF ACTIVE INGREDIENTS^{[13], [14], [15], [16]}

Table no 1: Pharmacognostical profile of active ingredients.

S.NO	NAME	BIOLOGICAL SOURCE	PARTS	CHEMICAL CONSTITUENTS	USES
1	Neem	<i>Azadirachta indica</i> (Meliaceae)	Seeds	Azadirachtin, glycerides, poly phenols, triterpenes	Anti-bacterial, anti-septic
2	Aloe Vera	<i>Aloe barbadensis</i> (Liliaceae)	Pulp	Polymannans, anthroquinone, C-glucosides.	Moisturizer and anti- ageing.
3	Almond	<i>Prunus communis linn</i> (Rosaceae)	Nuts	Protein, lipid, tannins, linolenic acid, amino acids.	Anti-oxidant
4	Turmeric	<i>Curcuma longa</i> (Zingiberaceae)	Rhizomes	Curcumin, zingiberine	Anti-septic and anti-inflammatory.

2.3. SOAP BASE FORMULATION

Table no 2: Soap base ingredient list.

S.NO	INGREDIENT	QUANTITY	USE
1	Coconut oil	75 gm	Anti-ageing, Moisturizer
2	Sodium hydroxide	13.28 gm	Lye
3	Distilled water	24.75 gm	Aqueous vehicle

Cold process method: For the preparing soap base, take 75 ml of coconut oil in a 500 ml of beaker. Place it on the water bath boil the liquid up to forming strong thickness under the temperature 40-45 °C with stirring. And monitor the temperature level by using thermometer. Then take sodium hydroxide or Lye was weighed into a clean beaker and add into the distilled water, again maintain the temperature by using

thermometer. Add this solution to the coconut admixture, boil at 40 -45 °C up to formation of base consistency. Then the mixture can be transfer into soap moulds and keep it the freezer up to 2-3 hours and then after 2-3 hours remove the soap containing moulds from the freezer and allow to 5 minutes without disturbance then soap will be formed.^[17]

2.4. FORMULA FOR POLY HERBAL SOAP

Table no 3: Formula of Poly herbal soap.

S.NO	INGREDIENTS	F1	F2	F3	F4	F5	USES
1	Soap base(gm)	50	60	65	70	75	Remove dirt from skin
2	Aloe Vera gel(gm)	2	2	2	2	2	Anti-oxidant, Anti-bacterial
3	Neem oil(ml)	1	1.5	2	1	2	Skin conditioner, anti-bacterial
4	Almond oil(ml)	1	1.5	2	1	2	Anti-oxidants
5	Turmeric (gm)	0.5	0.5	0.5	0.5	0.5	Anti-septic
6	Multan clay(gm)	0.25	0.25	0.25	0.25	0.25	Remove oil from skin
7	Rose oil(drops)	5	5	5	5	5	Perfume

2.5. POLY HERBAL SOAP FORMULATION PROCEDURE

For preparing polyherbal soap take the required volume of soap base in a 500 ml of beaker and maintain the temperature at 45°C to heat the soap base on the water bath without stirring. Then the soap base will be converted into liquid form. And also add the all ingredients to the above mixture. Boil the mixture at 45°C on the water bath to obtain proper mixture without stirring. Then the mixture poured into the soap moulds and freeze the soap containing moulds up to 2-3 hours. After 2-3 hours remove the soap moulds from the freezer allow to 5 minutes then soap will be formed.^[17]

3. EVALUATION PARAMETERS

Colour & shape: Colour and shape was checked by naked eye.

Odour: The smell of formulation was checked by applying preparation on hand and feels the fragrance of

perfume.

pH: The pH of the prepared soap was assessed by touching a pH strip to the freshly formulated soap and jointly by dissolving 1 gram in 10 ml water with the help of digital pH meter.^[18]

Foam Height: 0.5 grams of sample of soap was taken dispersed in 25 ml distilled water. Then, transferred it in to 100ml measuring cylinder; volume was made up to 50 ml with water. 25 strokes were given and stand till aqueous volume measured up to 50 ml and measured the foam height, above the aqueous volume was measured.

Foam Retention: 25 ml of the 1% soap solution was taken in to a 100 ml graduated measuring cylinder. The cylinder was covered with hand and shaken 10 times. The volume of foam at 1 minute intervals for 4 minutes was recorded.^[19]

Irritation: It is carried out by applying soap on the skin for 10 minutes. If no irritation then it is considered as non-irritant product.^[20]



Figure no: 1 Poly herbal soap.

4. RESULT AND DISCUSSION

S.NO	PARAMETERS	F1	F2	F3	F4	F5
1	Colour	Yellowish brown				
2	Odour	Aromatic	Aromatic	Aromatic	Aromatic	Aromatic
3	Shape	Oval	Oval	Oval	Oval	Oval
4	pH	6.7	6.8	6.7	7.0	7.2
5	Foam height	2.2 cm	2.5 cm	2.7 cm	2.9 cm	3 cm
6	Foam retention	3min 11sec	3min 17sec	3min 25sec	3min 32sec	3min 45sec
7	Irritation	Non irritant				

The above given table describes the colour, odour, shape, pH, irritation, foam height and foam retention of the polyherbal soap. The colour of all the five formulations were yellowish brown. The odour of all the five formulations was aromatic. The shape of all the five formulations was oval. As per evaluation test formulation F5 is may be the most standard formulation compared to other formulations because the pH of formulation F5 is 7.2 which is likely close to skin pH and there is no irritation beside foam retention and foamability of F5 is may be much better than other formulations.

5. CONCLUSION

The prepared polyherbal soap was formulated using cold process technique with antioxidant and Anti-bacterial properties. The anti-bacterial and anti-oxidant properties may exhibit due to the presence of acemannan, azadirachtin and amygdalin. The designed formulation F5 consisting 75 gm of soap base, 2 gm gel of *Aloe barbadensis*, and 2 ml oil of *Azadirachta indica* was found to be promising polyherbal soap with anti-bacterial and anti-oxidant properties. The further clinical studies of this formulation can elevate the use of polyherbal soap. The most important thing that polyherbal soap

possess is that free from chemicals and are more eminent than synthetic soaps. Thus, in this research paper, the prepared polyherbal soap possess anti-oxidant and anti-bacterial properties that can be used as beauty regime.

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