

Formulation of medicinal soap using herbal extract of fruits

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Abstract

An herbal medicinal soap was formulated using the leaf and bark extracts of *Punicagranatum*, *solanumlycopersicum*, *carrica papaya*. The antioxidant medicinal Soap was prepared using formulations of or combination of *Punicagranatum*, *solanumlycopersicum*, *carrica papaya*. The prepared formulation show good characteristics when evaluated for various physicochemical parameters. Hence, the formulation own good antioxidant effect and acceptable parameters, the prepared formulation can be further standardized and used as effective antiseptics, antimicrobial, antibacterial.

Keywords: *Punicagranatum*, *solanumlycopersicum*, *carrica papaya*, medicinal soap

Introduction

The soaps are being used in our day to day lifehaving a history long back for about six thousand years. An ancient Babylonians discovered a cleansing substance by mixing animal fats with wood ash and water, which was latterly known as “soap” [1]. The basic method of soap making is saponification, in which reaction of fats/oil with base/lye occurs. Soaps are generally of two types solid and liquid, in solid soaps NaOH is used as the base whereas KOH is used to obtain liquid soaps [2]. Medicinal soaps are slightly different from of the normal soaps where synthetic or natural bioactive ingredients are added into the basic soap medium to give vastvariety of biological activities to the final product [3, 4, 5, 6, and 7]. Due to the undesirable or harmful effects of synthetic substances, it is preferential to avoid the use harmful synthetic chemicals from medicinal soap products [3]. In recent years, the plant based natural products have become an attractive alternative of synthetic substances to enhance the important biological characteristics of medicinal soaps [3, 4, 5, 6, and 7]. The replacement of synthetic foaming agents such as sodium lauryl sulphate by saponins [8], synthetic antibacterial agents such as Triclosan [9] by natural antibacterial agents and synthetic antioxidants such as BHT [3] by natural phenolic compounds, served to overcome many side effects associated with the medicinal soaps which contain synthetic ingredients. Coconut oil, neem oil, olive oil, turmeric, venivel, sandalwood, jasmine and lemon essence are few of the most commonly used ingredients in skin care products including medicinal soaps [10].

Materials and methods

Collection of samples

The plants *Punica granatum*, *solanum lycopersicum*, *carrica papaya* were collected from Indore district at local market, the specimen were authenticated by Dr. Pawan deep department of Pharmacognosy and voucher number is HERB/MIPS/2018/0025 at MIPS, M.P.

Preparation of extracts

The fruits of *Punica granatum*, *solanum lycopersicum*, *carrica papaya* were dried in hot air oven at 35°C for three days, powdered to a mesh size of # 40 and stored in air tight containers. The powder was then extracted successively by refluxation for eight hours using ethanol, methanol.

Herbal soap formulation

Table 1

S.no.	Ingridiant	Quantity	Uses
1.	mineral water	50g	Solvent
2.	Lye/base (NaOH)	11.6g	Saponifying agent
3.	Coconut oil	20g	Saponifying agent
4.	Beeswax	3g	Hardening agent
5.	Olive oil	60g	Saponifying agent
6.	Papaya extract	2g	Antioxidant
7.	Tomato extract	2g	Antioxidant and antiacne
8.	Pomogranate extract	1.5g	Antioxidant and antibacterial

Calculation

20 g coconut oil x 0.181 g NaOH/g oil + 60 g olive oil x 0.134 g NaOH/g oil = 3.62 g + 8.04 g = 11.66 g NaOH required.

Procedure

1. Wearing gloves and goggles pour mineral water into a large saucepan. Add lye slowly, stirring gently until it is dissolved. Do not splash the lye onto your body, as it can cause severe burns.
2. Using a thermometer, monitor the temperature of the lye mixture until it is between 49°C and 60°C.
3. Meanwhile, in a separate saucepan, heat olive oil to between 120 degrees F and 140 degrees F, stirring in beeswax slowly.
4. Remove olive oil mixture from heat. Add lye mixture to olive oil mixture, stirring slowly and trying not to splash.
5. Stir occasionally, every 15 minutes or so, until the

mixture thickens and congeals. (It will have a texture similar to that of light mayonnaise.)

6. Stir in extracts combination and olive oil. Stir for 1 minute with a spoon (or with a whisk, taking care not to create any foam).
7. Pour into a greased or paper-lined soap mold. Gently tap mold to remove any air bubbles.
8. Let it stand for 48-72 hrs with occasional observance.
9. Turn soap out of the mold. Wait another day, then cut into bars as desired.
10. Dry bars for 2-3 days, turning occasionally to ensure they are drying uniformly.

Evaluation of physicochemical parameters of the prepared formulations

Various physicochemical parameters which are mentioned below were performed to establish quality of the prepared formulations.

Determination of clarity, colour and odour

Clarity and color was checked by naked eyes against white background, the odor was smelled.

PH

The pH of all the prepared formulations was determined by using Digital pH Meter. The formulations were dissolved in 100 ml of distilled water and stored for two hours. The measurement pH of formulation was done in previously calibrated ph meter.

Determination of percentage free alkali

About 5 gm of sample was taken in a conical flask and added to it into 50 ml of neutralized alcohol. It was boiled under reflux on a water bath for 30 minutes, cooled and 1 ml of phenolphthalein solution was added. It was then titrated

Result

Table 1

Formulation	Colour	Odour	Appearance	pH	% free alkali	Foam Height (cm)	Foam Retention (min)	Alcohol Insoluble matter	High temperature stability
soap	red	Characteristic	Solid	9.0	0.26	25	6.30	10.0	60°C

Discussion and conclusion

The fruits of *Punica granatum*, *solanum lycopersicum*, and *carrica papaya* were extracted using three ethanol, ethyl acetate, methanol increasing polarity and the extracts were subjected to formulation of medicinal soap. Results revealed that most of the extracts exhibited good antioxidant effect among which the ethyl acetate fruit extracts of *Punica granatum*, *solanum lycopersicum*, *carrica papaya* extracts. This is in accordance with the antioxidant activities of these plants listed in the literature 6, 7,9,11. Furthermore those extracts exhibiting maximum activity were selected and their combinations were included in our prepared soap formulations. Formulations were standardized by evaluating various physicochemical properties such as pH, spreadability, appearance,

extrudability, high temperature stability, in which they exhibited satisfactory characters. However these formulations need to be further standardized as good antiseptics, antibacterial and disinfectants.

Foam Height

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

Foam Retention

25 ml of the 1% soap solution was taken into a 100ml 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.

Alcohol Insoluble Matter

5 gm of sample was taken in a conical flask. Added it to 50 ml of warm ethanol and shaken vigorously to dissolve. The solution was filtered through a tarred filter paper with 20 ml warm ethanol and dried it at 105°C for 1 hour. The weight of dried paper was taken.

Formula

% alcohol insoluble matter = $\text{Wt. of residue} \times 100 / \text{Wt. of sample}$

High Temperature Stability

Liquid soap was allowed to stand at 50°C for one week. The stability of liquid soap was observed during this period. The sample which was homogeneous and stable liquid after standing was indicated as stable and the sample in which the crystals were roughened and the sample in which precipitation was caused; then liquid was said to be as unstable.

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