

## SHORT COMMUNICATION

# Development and Evaluation of poly-herbal Topical formulation

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### ABSTRACT

Poly-herbal soap was formulated using *Permotrema reticulatum*, *Tagatus nebula*, *Sapindus mukorussi* and *Curcuma cassia* hydroalcoholic extract. Ayurvedic cosmetics are also known as the herbal cosmetics the natural content in the herbs does not have any side effect on the human body most herbal supplement are based on several botanical ingredients with long histories of traditional or folk medicine usage. Many chemical toxins microorganism present in the atmosphere may cause chemical infection and damage to skin cosmetics alone are not sufficient to take care of skin and body parts. Poly-herbal soap was evaluated by using various evaluation parameters such as organoleptic characteristics, pH, foam height and retention, skin irritation and high temperature stability. Prepared Poly-herbal soap having good appearance better cleansing and foaming effect and doesn't have any side effects. This study was conducted to evaluate the effect of *Curcuma cassia*. Herbal soap ingredients were used *Permotrema reticulatum*, *Tagatus nebula*; *Sapindus mukorussi* and *Curcuma cassia* hydroalcoholic extract were found effective against some topical microorganism. Reetha acts as a detergent and having cleaning and foaming activity and Tulsi shows antiviral activity. Poly-herbal soap can be used for the prevention of skin diseases.

**Keywords:** Herbal soap, formulation, hand sanitizer, *Azadirachta indica*, *Ocimum tenuiflorum*

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## INTRODUCTION

Now a day's soaps are mostly used cosmetic preparation to clean and nourish the skin. The use of chemical soap in body which produced by chemical like-sodium hydroxide and oils are very hazardous since they are prepared by alkali reaction so they have high ph but our body and skin nourished best between 6.7 Ph. The aim of the study is to prepare a soap using polyherbs like-*Permotrema reticulatum*, *Tegetus nebula*, *Curcuma cassia*. Herbal soap is prepared by herbs so it is a less toxic and more ecofriendly preparation. Several herbal drug/extract having a potent antimicrobial, anticancer, anti-inflammatory, antifungal and many of other properties and they relates with body environment so less toxic. This study was conducted to evaluate the effect of *Curcuma cassia*. Herbal soap ingredients were used *Permotrema reticulatum*, *Tagatus nebula*; *Sapindus mukorussi* and *Curcuma cassia* hydroalcoholic extract were found effective against some topical microorganism. Reetha acts as a detergent and having cleaning and foaming activity and Tulsi shows antiviral activity. Poly-herbal soap can be used for the prevention of skin diseases [1-2].

### ***Permotrema reticulatum*:-**

*Permotrema reticulatum* is lichen firstly used traditionally as spices and also as a medicine for centuries in various countries. Lichens are not plant, they are combine organism that contain algae or cynobacterium or both which living between the filaments f fungus *Permotrema reticulatum* comes under the family permeliaceae having large foliose thali with broad erhizinate marginal zone on lower surface and reticulated molecule upper surface, pharmacologically *Permotrema* has a broad activity like-antimicrobial, antioxidant since they are symbiotic of mycobiont and photobiont they generate number of

metabolite and despised ,dibenzofurans,pulvinic acid and usnic acid due to presence of their compounds they are antiviral,antibiotics ,antioxidant, anticancer and allergenic in activity. Among there usnic acid is effective against various mechanism of action like Tuberculosis , streptococcus, pneumococcal and other gram positive bacteria .Reason behind the use of this lichen in soap is to provide antibacterial and antioxidant properties in product. The chemical which are commonly found in P.Reticulatum are Atranorin, chloratranorin, usnic acid ,beta-alectoronic acid , alpha-collatolic acid, Praesorediosic acid, Protocetraric acid etc [3].

#### **Tagatus petula**

Tagatus petula is commonly known as the marigold, which is an ornamental flower used in the decoration of house and also as a flavoring agent. It belong to the asteraceae family with genus tagatus, species petula. Which have about different 50 species, it is a perennial or annual herbaceous plant .In ancient time it is used in Indian medicine system as treatment of various disease evenly it is used in the treatment of cancer & hair fall. Marigold or *Tagetus nebula* are found in the all over world. It is used in anticancer, antibacterial, antifungal, activity .*Tagetus nebula* contains carious phytoconstituents such as thiophenes ,flavonoids, carotenoids and triterpenoids. *Tagetus nebula* is rich in the aromatic compound and resinous extract. Tagetus species are generally rich in oil & other phytoconstituents like monoterpine &in acyclic monoterpine ketones with pleasant odour. Chemical which are generally found in Tagetus petula plant is monoterpine:-dihydrotagetine, limonin, terpine, terpenon, myrsin. The constituents of tagetus petula alkaloid, terpinoids, flavonoids are found in large quantity. In T.petula (root and leaves) are found thiophene steroid and terpenoidal type of constituent. Some of flavonols are also found like: - Quircetin, Quiratagetin, Quiractin-3-g lucoside etc [4-6].

#### **Sapindus mukorossi**

It is commonly known as Indian soapberry, washnut, or ritha. It is a species of tree in the family Sapindaceae. It is a deciduous tree that grows in the lower foothills and midhills of the Himalayas at altitudes of up to 1,200 metres (4,000 ft). It is also native to western coastal Karnataka, Maharashtra, and Goa in India. The major constituents of *Sapindus mukorossi* fruit are saponins (10%-11.5%), sugars (10%) and mucilage<sup>10</sup>. Saponins are secondary plant metabolites with divergent biological activities. The value of the tree mostly comes from its fruit, which can be used for many pharmacological and cleansing purposes [7].

#### **Curcuma cassia-**

Curcuma cassia is characterised by the small rhizome structure, greyish to brown in colour inside the rhizome its persists the light black colour a characteristics aroma and taste the leaf of the plant is generally green and size of leaf typically about 30-60cm long and 15cm broad,deep green colour in the middle are a spike is come out with flower of purple colour .The leaves of the curcuma cassia are green upto the rhizome base. Chemical constituents-curcuma cassia contains 5% of volatile oil; resins are also found curcumonid which have a together portion of the curcuma (50-60%) [8].

### **MATERIAL AND METHODS**

#### **Collection, identification and processing of plant**

*Tagetus petula* was collected from the Garden of Chandra shekhar Singh group of institute (pharmacy campus) in the month of September last. *P. reticulatum* was collected from the whole sale market of spices, chowk Prayagraj. *Curcuma caesia* (Root hairs) From the Pharmacognosy Laboratory of Chandra shekhar Singh College of pharmacy. All of these plants dried in hot air oven, pulverized and stored in airtight bottles for the studies. All the plant materials were collected from local market and other chemical agents were used a analytical grade

#### **Extraction**

All the collected, washed and dried plants materials were grinded. The grinded plant materials were passed through sieve no. 60. The passed plant material were soaked for 15 days in ethanol and water (70:30) ratio. After 15 days were filtered, evaporated and was dry. The dried plant extracts were stored in suitable condition for further used [9-10].

$$\text{Percentage yield} = \frac{\text{Weight of extract}}{\text{Weight of powder drug taken}} \times 100$$

#### **Formulation of herbal soap**

The collected plants were dried under the roof for about 15 days. Then it was sun dried for 3 hrs. The dried collected herbal drug was crushed separately for 15 days in 80:20 ratios. Then it was evaporated,

founded extract was dried and weighed and putted in a refrigerator for time till the next step of procedure. Like the same all extracts were collected in kept in freeze [11].

**Step 1:- preparation of fragrance for the soap:-**

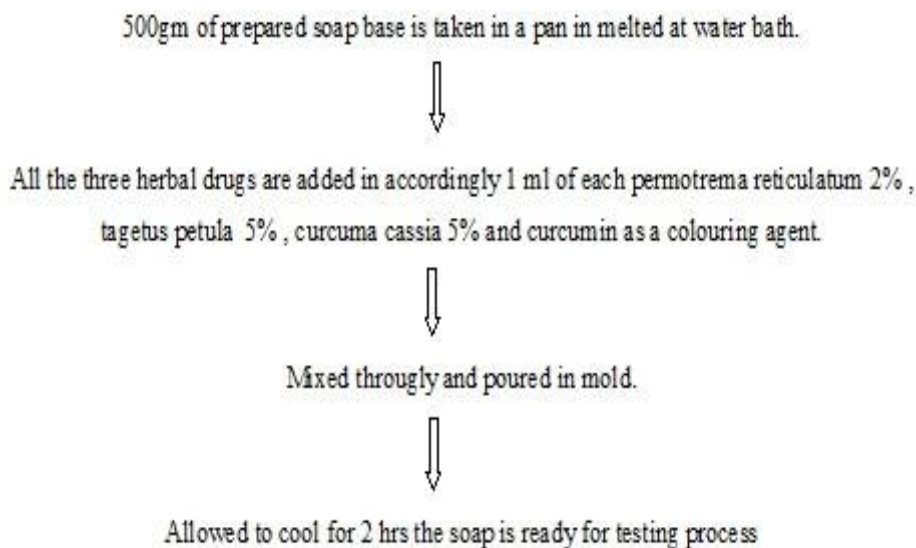
Fresh petals of rose collected from the campus of Chandra shekhar Singh College of pharmacy. The petals are dipped over night in a capped bowl in aqueous medium for extraction of rose water fragrance.

This obtained rose water is just used as a solvent in the preparation of soap base thus is gives fragrance in soap.

**Step 2:-preparation of soap base:-**

In Soap base preparation Lye (NaOH) was dissolved in distilled water then cooled to room temperature, and then it was mixed together with oil and heated to room temperature again. Then it was carefully poured into lye water and blended until to “trace” form. Then it was allowed to mold. The different types of oil were used to synthesis soaps such as coconut oil, olive oil, castor oil, gee oil and palm oil with composition of NaOH, H<sub>2</sub>O(containing rose fragrance), oil (1:3:7) respectively.

**Step 3:-** preparation of medicated soap using prepared soap base and extracted all three active herbal drugs:-



**Figure: 1 Flow chart of process of poly-herbal soap preparation**

**Evaluation of poly-herbal soap [12]**

The herbal soap formulated was evaluated for the following:

**1. Organoleptic evaluation:-**

Colour:-brown

Odour:-orange

Appearance: -Good

**2. Physical evaluation:-**

The herbal soap formulated was evaluated for the following properties:

a) **pH:** - the pH was determined by using pH paper .the pH was found to be slightly acidic in nature [13].

b) **Foam retention:** - 25 ml of the one percent soap solution was taken into a 100 ml graduated measuring cylinder the cylinder was covered with hand and shaken 10 times. The volume of foam at 1minut interval for 4 minutes was recorded .It was found to be 5 minutes.

c) **Foam height: 10 cm**

0.5gm of sample of soap was taken dispersed in25 ml distilled water. Then, transferred it into 100 ml measuring cylinder; volume was make up to 50 ml with water. 25 strokes were given and stand till aqueous volume measured upto50 ml and measured the foam height, above the aqueous volume.

**3. Primary skin irritation test:**

For this three volunteers were selected and the prepared soap were given to them and checked for irritation.

**4. High temperature stability:**

The soap was allowing stand at temperature above 50°C.



**Figure: 2. Image of prepared soap**

## RESULTS AND DISCUSSIONS

The physicochemical parameters of the prepared soap were determined. All of parameters such as color, odour, appearance, pH were tested. Ploy-herbal formulations showed better appearances characteristic as well as the pH were found in the range 7.0 which is the desired pH. Other parameters such as percentage free alkalie, Foam height, Foam retention. The results are shown in tables. Ploy herbal soap was prepared by using melting process technique and was found to be without particles transparent components. Selected formulations are having good compatibility without any significant changes. The prepared formulation is showing good physical characteristic. On the basis of evaluation studies the formulations provide excellent foaming property, free from alkali components. The Poly-herbal soaps having potential antimicrobial and antioxidant bioactive components therefore formulation also having antimicrobial antioxidant property. The poly-herbal soap formulation can be used for the treatment and management of aging and various others skin diseases [14-16].

**Table: 1. Composition of poly-herbal soap preparation**

S. N.	Ingredients	Quantity (%)	Use
1	Stearic Acid	1 gm	Hardening
2	Soft Paraffin	0.70	Hardening
3	Ethanol	5ml	Solvent
4	<i>Permotrema reticulatum</i>	4gm	Antibacterial
5	<i>Sapindus mukorussi</i>	3gm	Surfactant
6	<i>Tagetus petula</i>	2gm	Cleanser
7	<i>Curcuma cassia</i>	1gm	Antiviral
8	Orange oil	q.s	Perfume

**Table 2: - Evaluation results chemical parameters**

S. N.	Chemical parameters	Herbal soap	Standard
1	pH	6.4	6.5-7.5
2	% free alkalie	0.27	0.25
3	Foam height(cm)	2.5cm	2.5-3.0
4	Foam Retention(min)	2cm	0.5-2.5
5	Alcohol insoluble matter	18.0	18.0
6	High temperature stability	Soap melts above 45°C	45°C

## DISCUSSION AND CONCLUSION

The formulated soap showed considerable antibacterial activity as the commercial standard and all the other parameters were good, and hence, it can be concluded that the formulated herbal soap must be standardized and can be used as a promising alternative to commercial chemical containing skin whitening soaps. The plants *Permotrema reticulatum*, *Curcuma cassia*, *Tagetus petula* were extracted using four different solvents of increasing polarity and the extracts were subjected to antimicrobial screening. Results revealed that most of the extracts exhibited good antimicrobial effect among which the ethyl acetate bark extracts of *Permotrema reticulatum*, *Curcuma cassia*, *Tagetus petula* extracts of and curcuma cassia exhibited maximum activity with zones of inhibition ranging from 14 to 18 mm. This is in accordance with the antimicrobial 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 and hand sanitizer formulations. The prepared formulations when tested for antimicrobial activity exhibited zones of inhibition ranging from 18 to 26 mm which was far better than the zones of inhibition of individual extracts. This enhancement of antimicrobial properties may be attributed to the synergistic effect or total sum of effects produced by the combinations of extracts. Furthermore, the

prepared soap and hand sanitizer formulations were standardized by evaluating various physico-chemical properties such as pH, spreadability, appearance, extrudability, high temperature stability, in which they exhibited satisfactory characters. These formulations can be used as good antiseptics and disinfectants [15-18].

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