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EVALUATION OF GERMICIDAL SOAP & IT'S COMMERCIALIZATION SCOPE

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Abstract: In the present research soap synthesized with natural Neem Leaves (*Azadirachta indica*), Lemon Leaves (*Citrus limon*), Mango Leaves (*Mengifera indica L.)*, Aloe Vera gel, Tulsi (*Ocimum tenuiflorum*), chandan (*Indian sandalwood*), Orange (*Citrus sinensis*) and Turmeric were used. Soap mostly use synthetic materials that can cause side effects, the selection of natural products is expected to reduce the growth of bacteria that can cause skin irritation.The examination of total fatty matters, saponification number, pH test and antibacterial activity were done by a scientific method and obtained reliable results, which are necessary for a grade - 1 soap.

Key words : **Soap base, TFM value, saponification number, antimicrobial screening.**

INTRODUCTION

Cleansing the skin is very important to maintain and improve skin integrity[1]. Soap is a compound that can reduce water surface tension that remove dirt and oil[2]. The soap - making process, called saponification, is the alkaline hydrolysis reaction of triacylglycerol[3]. Soap molecules consist of long hydrocarbon like chain. The hydrocarbons consist of carbon atoms with very polar or ionic groups at one end. Carbon chains are lipophilic (dissolved in fats and oils) and Hydrophilic polar ends (dissolved in Water).

Soaps are chemical compound formed as a result of reaction between fatty acids, oils, and salts[4] . According to Osbore and Grobe antibacterial soaps can remove 65 to 85% bacteria from human skin[5].

The use of ingredients in soap making is expected to improve the quality of the resulting soap. The natural ingredients that can be used in the process of making soap are Neem Leaves (*Azadirachta indica*) , Lemone Leaves (*Citrus limon*), Mango Leaves (*Mengifera indica L.*), Aloe Vera gel, Tulsi (*Ocimum tenuiflorum*), Orange (*Citrus sinensis*), Chandan (*Indian sandalwood*) and Turmeric. soaps are made using various natural sources, which also includes organic ingredients.

The difference in leaf features of each type of plant makes leaves as one of the references for classifying each type of plant[6]. The part of the mango plant that is rarely used is the leaves which can be one of the additional ingredients in making bathing soap.

Neem oil contains various types of neem limonoids which can prevent mutagenic effect[7-10]. Lemon contains large spectrum of biological activity including antibacterial, antifungal, antidiabetic, anticancer and antiviral activities[11,12] . Aloevera gel contains 99.5% water, so it acts as a very fine moisturizer. It is used in many cosmetic products and medicines[13]. Tulsi contains chemical and medicinal properties. Chandan contains antioxidants that help reduce skin irritation and itching. It has essential oil that gives cooling and hydrates the skin[14].

EXPERIMENTAL SECTION

Synthesized three soaps using natural ingridients. Soap base was prepared using conc.NaOH, coconut oil and SLS (Sodium Lauryl Sulfate) added as a surfactant.

Soap-1 was prepared by melting 50gm soap base in water bath and adding 3 ml of extract of neem leaves, mango leaves, lemon leaves and tulsi each in it. 5g of aloe vera gel was added which is source of vitamin E. 0.5g of turmeric powder was added which is anti-oxidant and exhibits antibacterial properties. 0.5ml of glycerin was added with constant stirring. That mixture moulded for 24-48 hours.

Soap-2 was prepared by melting 50gm soap base and adding 2ml of extract of neem leaves ,tulsi and turmeric, glycerin and aloe vera gel. 0.2gm Chandan and 0.3gm orange powder was added for fragrance. The mixture moulded for 24-48 hours.

Soap-3 was prepared by adding 5gm of coconut extract to melted 50gm soap base. 5ml of glycerin added in the hot slurry and The mixture was mould for 24-48 hours.

RESULT & DISCUSSION

pH Test: The small quantity of soap sample dissolved in distilled water then measured by calibrated pH meter.

% of TFM: 5 gm sample of soap was dissolved in 100 ml of distilled water. 40ml of 0.5 N concentrated nitric acid was added to the soap solution. Heat the mixture in the water bath until a fatty layer separate over the solution. Solution was cooled to solidify the fat and filtered it. 50ml of chloroform was added to the filterate to calculate the % of TFM.

SAPONIFICATION VALUE: Saponification value is determine by the number of milligrams of KOH required to completely hydrolyse one gram of the oil/fat. Saponification number can be calculated by the difference between blank titration (except fat) and actual titration (with fat) multiplied by the molecular weight of KOH.

TABLE-1: Result of analysis

Product	pH value	% of TFM	SAPONOFICATION VALUE
Soap-1	7.15	75	182.12
Soap-2	7.05	74	182.32
Soap-3	7.02	76	207.57

Antibacterial activity: Prepared soaps were tested for their antibacterial activity against E.Coli (gm -Ve) & Becillus (gm +Ve) bacterias. The test bacterial isolates were inoculated on to a plate of Muller Hinton Agar using a sterile swab, excess fluid was removed by turning the swab to avoid overinoculation of plates and then the bacteria inoculum was spread on the surface of the media. Soaps were formulated into 10mg concentration. 0.1 ml of chloramphenicol were added into each of the wells. Well containing chloramphenicol alone

acts as a negative control. The plates were allowed to stand for 30 min and then incubated at 37 °C for 24 h. Determination of antibacterial activity was done by recording the diameter of inhibition zone in mm[15].

Table-2 : Zone of inhibition in mm (Antibacterial Activity)

Bacteria	Soap-1	Soap-2	Soap-3	Standard
Escherichia Coli	10	12	11	4
Bacillus	12	14	16	5

COSTING (INR)

Table-3:Costing of the soaps

Raw Material	Price/50 gm	Quantity Soap 1	Price Soap 1 Rs	Quantity Soap 2	Price Soap 2 Rs	Quantity Soap 3	Price Soap 3 Rs
NaOH	30 Rs.	5gm	3	5gm	3	5gm	3
Coconut Oil	15 Rs.	40ml	12	40ml	12	12ml	12
Orange Powder	20 Rs.	-	-	1gm	0.4	-	-
Turmeric Powder	14 Rs.	1gm	0.28	1gm	0.28	-	-
Chandan Powder	22 Rs.	-	-	1.5gm	0.66	-	-
Glycerine	40 Rs.	1ml	0.8	1ml	0.8	1ml	0.8
SLS	30 Rs.	2gm	1.2	2gm	1.2	2gm	1.2
Coconut Extract	25 Rs.	-	-	-	-	5gm	2.5
TOTAL COST			**17.28**		**18.34**		**19.5**

Table-4: Final Price

SAMPLE	PRICE/50gm
SOAP-1	17.28 Rs.
SOAP-2	18.34 Rs.
SOAP-3	19.50 Rs.

CONCLUSION

Looking towards daily & commercial need we designed these economical soaps using plants which exhibits medicinal properties. The synthesized soaps subjected to antibacterial screening. All three soap shows potent antibacterial activity against E. coli (gm-Ve) bacteria & Becillus (gm +Ve) bacterias. This soap is relatively less costly compare to market survey. So, this innovation can be formulated for commercialization.

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