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International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

"Formulation of Herbal Laundry Soap from Hingot Fruit"

Gade Omkar Pralhad[1], Potekar Omkar Tanaji[2], Prof. Rupnawar Mayuri[3], Hagawane Sairaj Gajanan[4], Chavan Pradnya Vijay[5]

[1245]Student ,Late Laxmibai Phadtare College Of Pharmacy, Kalamb, India
[3]Assistant Professor Of Late Laxmibai Phadtare College Of Pharmacy, Kalamb, India

ABSTRACT :-

Balanites aegyptica is also known an desert date is a spiny shrub or tree upto 10M tall , it is widely distributed in dry and arid areas of Africa and South Asia.It is belongs to the family Balanitaceae , it is a woody evergreen spinous flowering tree .

It consists of saponins, flavonoids, fatty acids, alkaloids, lipids, protiens, carbohydrates, and various organic acids. Different parts of plant having different medicinal properties and are used in preparation of folkoric medicines which are used in treatment of many diseases, such as various saponins are present in plant and which are used as to decrease blood lipid level, lower cancer risk and lower blood glucose level.

Balanites aegyptica also contains the various types of oils, the oil yield is upto 45wt% in which majority of fatty acids such as palmitic acid(16.07wt%), oleic acid (39.79wt%) , and Stearic acid the sodium salt of that fatty acids having a foaming property and also the sodium salt of fatty acids are used in the preparation of soaps. In this review we studied various fatty acids and salts which are used to make the herbal laundry soaps which having cleansing property.

KEYWORDS: Balanites aegyptica , Extraction , Fatty acids

INTRODUCTION:-

The prickly, multibranched Balanites aegyptiaca shrub can reach a height of 10 meters. Petioles on alternating, two-foliate leaves measure 3–6 mm in length. The petioles on elliptic leaflets can reach a maximum length of 5 mm and are broadly pointed. The plant has simple, straight, robust, inflexible spines that are up to 5 cm long, alternating, green, and supraaxillary. Supraaxillary clusters, or infrequently supracemose clusters, are the form of inflorescence. The tiny, fragrant, bisexual, greenish-white blooms are grouped in axillary clusters and can be few or numerous, arranged in cymes or fascicles. There are five (free) oval, 3 mm long sepals. The petals are oblong-obovate, longer than the sepals, and there are five in all (two free). There are 10 stamens, glabrous filaments, and dorsifixed anthers.

Taxonomical profile:

Kingdom: Plantae
Division: Magnoliophyta
Class : Magnoliopsida
Order : Sapindales
Family : Zygophyllaceae
Genus : Balanites Delile
Species : Balanites aegyptiaca (L.) Delile
Synonyms: Ximenia aegyptiaca L. (excl. Balanites roxburghii Planch), Agialida senegalensis van Tiegh., Agialida barteri van Tiegh., Agialida tombuctensis van Tiegh., Balanites ziziphoides Milbr. Et Schlechter, Balanites latifolia (van Tiegh.) Chiov.

Vernacular name:

Ayurvedic : Ingudi, Angaar Vrksha, Taapasadrum, Taapasa vrksha, Dirghkantaka. Unani : Hingan, Hanguul.
Siddha : Nanjunda.

Folk : Hingol, Hingota, Hingothaa.

English : Desert date, Soapberry tree, Thorn tree, Egyptian balsam Arabic : Heglig
French : Dattier du desert, Hagueleg, Balanite Spanish : corona di Jesus

Pharmacological qualities:

Information sources, components utilized, constituent compound accountable for pharmacological qualities, and pharmacological activity
Insecticidal Activity:
Because B. aegyptiaca contains larvicidal properties in its extracts rich in saponins from a variety of tissues, including fruit pulp, kernel, root, bark, and leaf, it may be used as a natural larvicidal agent against mosquito larvae.8. It was determined that Aedes arabiensis larvae were the most susceptible, followed by Culex quinquefasciatus and Aedes aegypti, after the fruit kernel of B. aegyptiaca was proven to be effective against Aedes arabiensis, Culex quinquefasciatus, and Aedes aegypti larvae. 8.Of the plant's parts examined, the root extract proved to be the most dangerous, followed by the bark (fruit pulp, seed kernel, root, bark and leaves)9. Based solely on the really low adult emergence (18%) on utilizing

Literature of Review:

1] H. U. Vaghasiya, Daya L. Chothani An overview of the phytochemical components, traditional use, and medicinal activity of Balanites aegyptiaca Del (desert date) Sent on August 20, 2010. A thorough review of the literature showed that "desert date" has a lengthy history of traditional treatments for a variety of illnesses. Antioxidant, antimicrobial, anticancer, diuretic, hypocholesterolemic, wound-healing, antiviral, antidiabetic, hepatoprotective, mosquito larvicidal, antivenin, anthelmintic, cardioprotective cum antioxidant activity, and antinociceptive properties are all demonstrated by experimental evidence in B. aegyptiaca Del.
2] Yaser Hassan Dewir 2,3,* and Abdullah Ibrahim, Guggalada Govardhana Yadav 1, Hosakatte Niranjana Murthy 1, and Two Desert Dates' Phytochemicals and Biological Activity (Balanites aegyptiaca (L.) Delile) Published on December 25, 2020. The desert date, B. aegyptiaca, is a species of tree that is underappreciated.
3] Medicinal Properties of Desert Date Plants by Saed A. Al-Thobaiti and Isam M. Abu Zeid 2018, 01–12; Global Journal of Pharmacology, 12 (1). It is clear that more research is required to fully investigate the use of B. aegyptiaca (L.) Del, pharmacological activities, and the potential for

safe and effective treatment of a variety of disorders with a deeper comprehension of the precise mechanisms of action. 4] Balanites aegyptiaca (L.) Del. (Hingot): A review of its pharmacological characteristics, phytochemistry, and traditional applications by J. P. Yadav and Manju Panghal July–September 2010 issue of International Journal of Green Pharmacy. The evergreen B. aegyptiaca tree grows in the drier regions of India.

5] Pharmacognostic and phytochemical investigation of ingudi (balanites aegyptiaca linn. delile) seeds, Sonu Rajek1, Rajnish Kumar Gautam2, Gagan deep kour3, and Preeti Sharma4, International Ayurvedic Medical Journal, (ISSN: 2320 5091) (July, 2017) 5(7). In this work, pharmacognostical and phytochemical studies were prioritized in order to identify lead compounds for the development of innovative herbal drugs. "6] discusses the extraction and physicochemical analysis of desert date (balanite aegyptiaca) seed oil" appears in the International Journal of Advanced Academic Research | Sciences, Technology & Engineering | Vol. 4, Issue 4 (April 2018), with authors Ogala, H1, Elinge, C.M1, Wawata I.G1, Adegoke, A.I3, Muhammad, A.B2, and Ige, A.R1. Due to its high oil content, the preliminary analysis conducted for this work yielded results that indicated desert date seed oil is a commercially feasible oil source. Additionally, the oil properties demonstrated that the oil was a good feedstock for both home and industrial uses because it was primarily consisted of somewhat long chain fatty acids with a degree of unsaturation.

7] Kime B, Barminas J. T., Nkafamiya I. I., Akinterinwa A.* Extracting and Assessing a Saponin-Based Surfactant from the Balanites aegyptiaca Plant for Use as an Emulsifying Agent July 2015 issue of IJISET, the International Journal of Innovative Science, Engineering & Technology, vol. 2. B. aegyptiaca plants have been identified in this investigation as a source of a surfactant based on saponins. The B. aegyptiaca bark extract's emulsion capability and stability further suggest its superiority over a commercial or synthetic surfactant. Because it is environmentally beneficial, using B. aegyptiaca bark extract as a fundamental raw material would further improve greenness.

8) Mohamed, A. M., W. Wolf, and W. E. Spiess, The capacity of saponin to bind with proteins could be one reason for this inhibition.

9) Z. Sherif and A.A. Elfeel, The possibility that the kernel can be used for oil production and the cake as a nutrient is suggested by the high oil content as well as the high protein and mineral content of the leftover cake.

10) Al Ashaal, H.A., M.M. Abd El Azizc, A.A. Farghaly, and M. Ali The findings validate the significant potential of Balanites aegyptiaca fixed oil as a medical oil in addition to its application as an edible oil. They also support the significance of screening plants as a means of identifying bioactive chemicals.

11) Modibbo, U.U., A.J. Manji, and E.E. SarahSince the oil doesn't dry out, it might not be a suitable raw material for paints and other goods. The presence of saponin, which was first suspected in the research, was verified, and this contributed to the liquid soap's excellent lathering qualities.

AIM & OBJECTIVES

Aim: Formulation of Herbal Laundry Soap From Hingot Fruit.
Project's rationale:

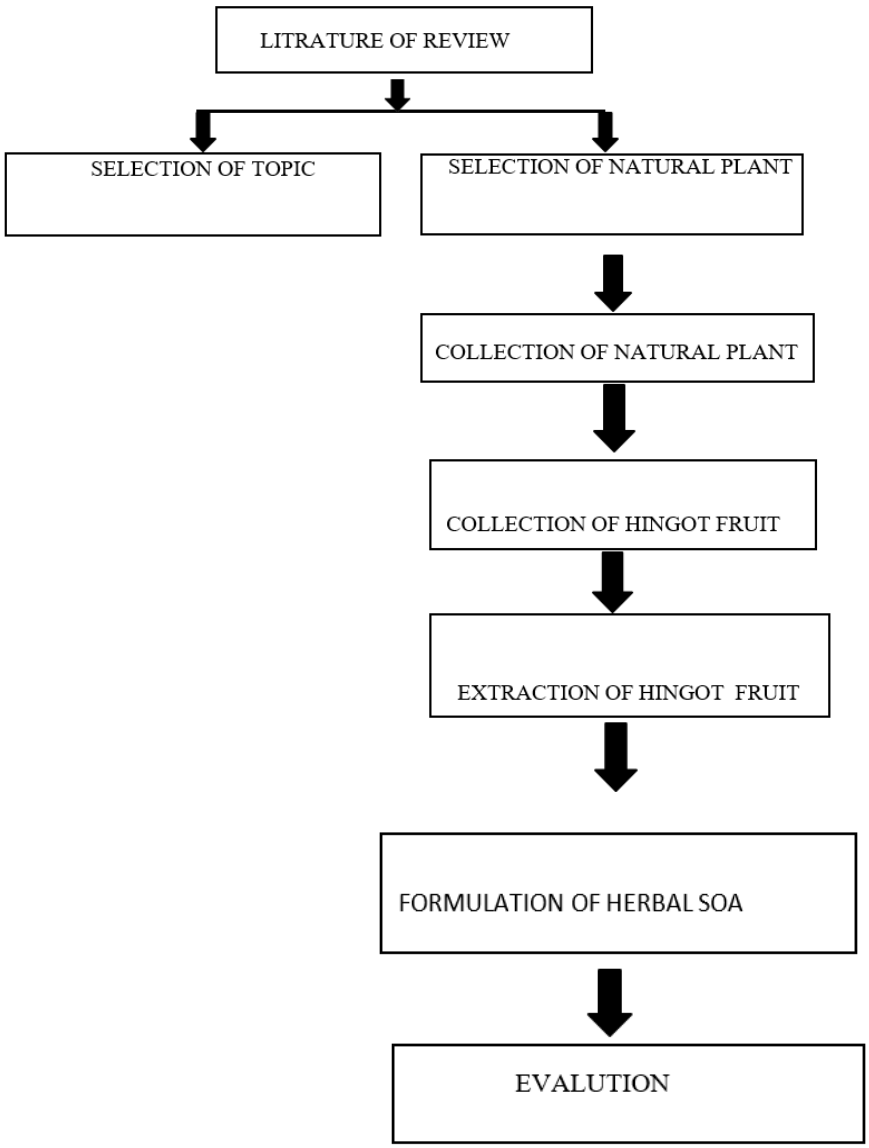
Balanites aegyptica, sometimes referred to as desert dates, are prickly shrubs or trees that grow widely in arid regions of South Asia and Africa.Saponins, flavonoids, fatty acids, alkaloids, lipids, proteins, carbohydrates, and other organic acids are its constituents. The goal of the current work is to formulate herbal laundry soap using the foaming characteristics of fatty acids (oleic acid and linolieic acid) isolated from Balanites aegyptica. We are able to examine the various foaming or detergent qualities of the plant Balanites aegyptica from the formulation study mentioned above.

Objectives:

1. Balanites aegyptiaca fatty acid extraction may exhibit good detergent activity.
2. The creation of herbal laundry soap is made possible by the detergent activity of fatty acids, specifically oleic and linolieic acid.
3. Made from Balanites aegyptiaca, herbal soap is good for the environment and harmless.
4. It has been suggested that the oil extracted from the seed be used to make soap.
5. Soap's surfactant helps to keep stains, grease, and other particles off clothing.

PLAN OF WORK

Plan of work:



Name of Ingredients:

Sr.no	Ingredients	Role
1.	Oleic acid	Fatty acid
2.	Stearic acid	Fatty acid
3.	Soap Base	Making Hard Soap
4.	Methyl Paraben	Preservative
5.	Sodium Lauryl Sulphate	Anionic Surfactant
6.	Sodium Hydroxide	Saponification Reaction

7.	**Water**	**Vehicle**

List of apparatus:

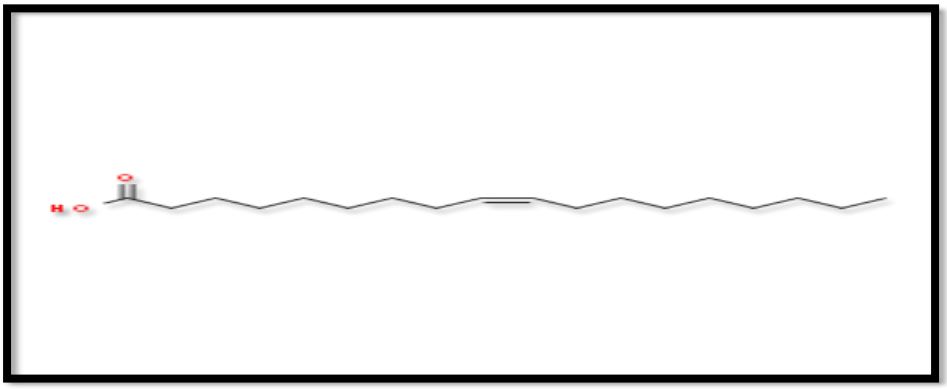
Sr.no	List of apparatus
1.	Beaker
2.	Measuring cylinder
3.	Mortar pesters
4.	Soap Mould
5.	Burner
6.	Wire Gauze
7.	Glass rod
8.	Porcelain dish

List of instruments:

Sr. no.	Name of Instrument	Make	Model
1.	UV/VIS	Perkin Elmer	Lambda35
2.	PH meter	Thermo	720A
3.	IR spectrometer	Perkin Elmer	Spectrom One
4.	Melting point Apparatus	Mettle Toledo	FP81HT
5.	Analytical Balance	Aicoset Electronic Balance	FX-300
6.	Magnetic Stirrer	Remi	-
7.	Hot Air Oven	York Hot Air Oven	

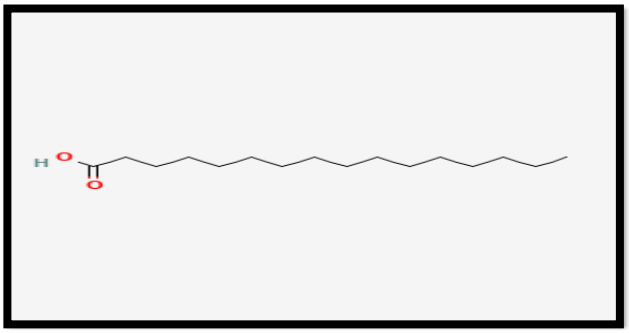
Oleic Acid

Generic Name: Oleic Acid Molecular Weight: 282.4614 Chemical Formula: C18H34O2 Chemical Structure:



IUPAC Name: (9E)-octadec-9-enoic acid Melting point: 13.4 °C [56 °F]
pka Value: 9.85 Appearances: Yellowish
Solubility: Soluble in ethanol (>25 mg/ml), ether, acetone, chloroform, DMF (100 mg/ml), DMSO (100 mg/ml), and PBS (pH 7.2) (<100 µg/ml).
Category: monounsaturated omega-9 fatty acid.

Palmitic Acid
Generic Name: Palmitic Acid Molecular Weight: 256.241 Chemical formula: C16H32O2 Chemical structure:



IUPAC Name: hexadecanoic acid Melting Point: 62.9 °C
pka value: 4.75

Appearance: colourless with white crystalline scales Solubility: Soluble in water
Category*:* saturated fatty acid

Sodium Hydroxide:
Generic Name: sodium hydroxide Molecular Weight:39.9971 Chemical Formula: NaOH Chemical structure:

IUPAC Name: Sodium hydroxide, Sodium oxidanide Melting Point:318°C

pka Value:4.75

Appearance: white crystalline Solubility: Soluble in Water Category: Alkali Metal hydroxides

EXPERIMENTAL WORK AND RESULT

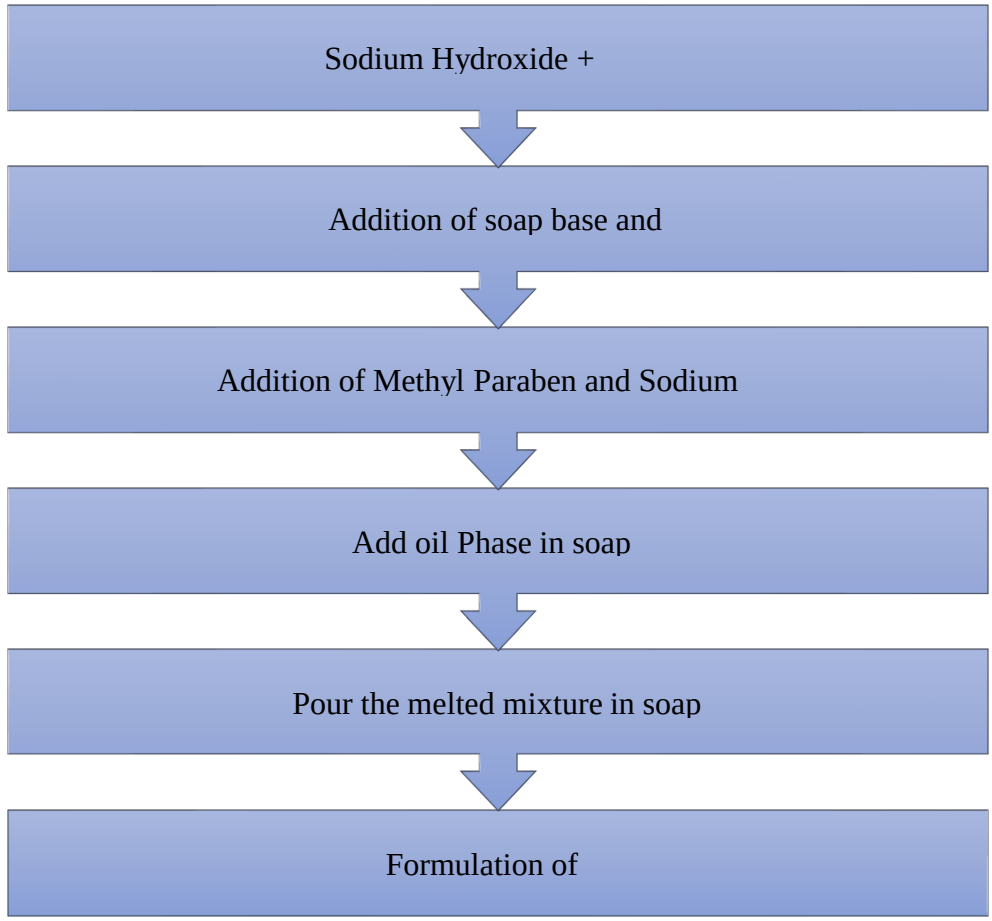
Work done through experimentation and outcome: Sample gathering and authentication the fruits of the Balanites aegyptiaca Linn. (desert date) plant, which were employed in this study, were sourced from Karjat and verified at the botany laboratory at the College of Agriculture Baramati.The fruits of Balanites aegyptiace are harvested and authenticated, and then their shells are split open with a metal hammer to reveal the seed. Using a mortar and pestle, the dry seeds were ground into a cake to break down the cell walls and release the oil for extraction.

Extracting the oil from desert date seeds:
After measuring out about 150 mL of n-hexane, it was added to a flask with a circular bottom. 100g of the sample was put into the thimble, which was then put into the extractor's center. After the solvent reached 70˚C, it boiled and the vapor rose through the vertical tube and into the condenser located at the top. The solid sample that needed to be removed was inside the center filter paper thimble, and the liquid condensate dropped into it. The extract filled the siphon tube after seeping through the thimble's pores and flowing back down into the flask with a round bottom. For around four hours, this was let to go on in order to optimize the oil yield.

Method of formulation:

Melt and pour
Using a computerized weighing balance, precisely weigh each ingredient.
In a beaker, combine 1g of sodium hydroxide with 10 ml of hingot seed oil, and mix thoroughly by aggressively stirring.

Place 35g of soap base in a separate beaker. Place both beakers on a hot skillet, making sure they stay at the same temperature.
Melt the soap base and stir continuously while adding sodium carbonate and methylparaben.
Proceed to add the oil phase while continuously swirling it into a beaker filled with soap base.
Finally, transfer the melted mixture into a soap mold and let it cool for a full hour.



Preformulation studies: Pre-formulation research concentrates on the drug's physicochemical characteristics that may have an impact on how well it works and how to create an effective dosage form. Put more simply, pre-formulation research only verifies that there aren't any major obstacles

standing in the compound's development's way. Prior to creating any dosage form, the purity of the API must be ascertained. Pre-formulation studies help identify the components of a formulation, the physicochemical characteristics of a novel drug substance, the creation of an analytical technique, and whether the drug substance is compatible with conventional excipients.
Pre-formulation testing, including drug polymer interaction studies and authentication tests, were performed on the model drug.

Infrared spectral studies:
FTIR spectra of model drug was obtained using perkin Elmwe 1600 FTIR spectrometer using diffuse reflectance technique (KBr disc technique) as a part of quantitative analysis by comparing it with the spectra of model drug USP standard. Samples of model drug powder and model drug USP standard were previously ground and mixed with dried KBr. The KBr discs were prepared by compressing the powder and the scans were obtained in the mid- infrared region of the spectrum from 4000cm-1 - 400cm-1 at resolution of 1cm-1. The spectra od model drug sample was then compared with the model drug USP standard spectra of salt form of model drug as shown in (BP2009)

Evaluation of herbal laundry soap:
The herbal laundry soap formulated was evaluated for the following

Organoleptic Evaluation:

Sr.No.	Organoleptic Evaluation	Result
1.	Color	Yellowish
2.	Odour	Characteristic
3.	Appearance	Smooth

Physical evaluation

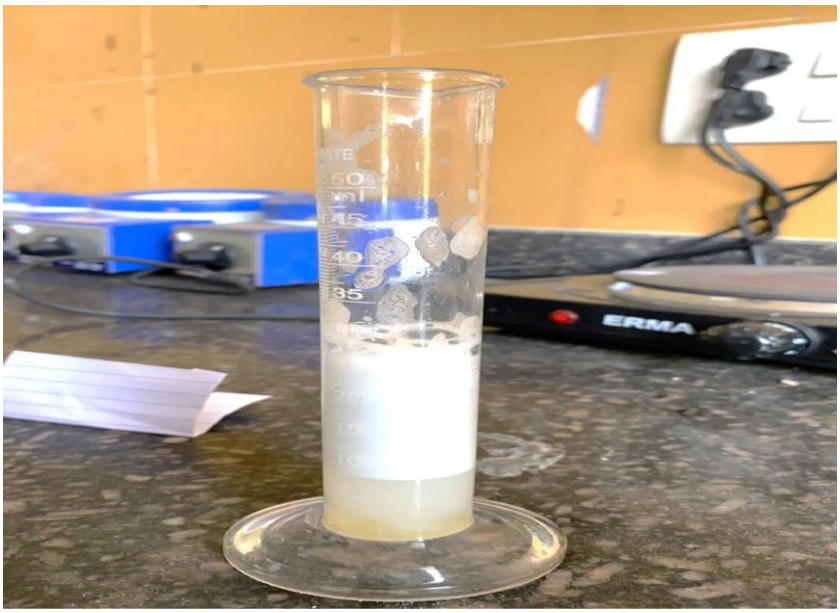
The herbal soap formulated was evaluated for the following properties:
pH:
The pH was determined by using a pH meter, and the pH was found to be basic in nature.

Sr. No	Batches	pH
1	F1	8.1
2	F2	7.8
3	F3	8.8
4	F4	8.4

Foam height:

10ml of water is taken in 50ml of measuring cylinder, to the cylinder 2gm of soap is added. The measuring cylinder is shaken for 5 minutes to obtain a foam.

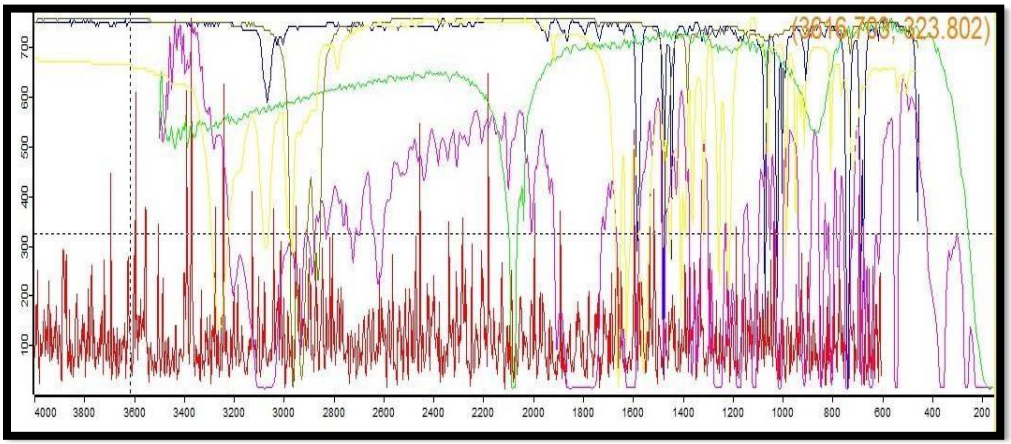
SR. No	Batches	Height
1.	F1	22
2.	F2	25
3.	F3	24
4.	F4	22



F) FTIR Study:

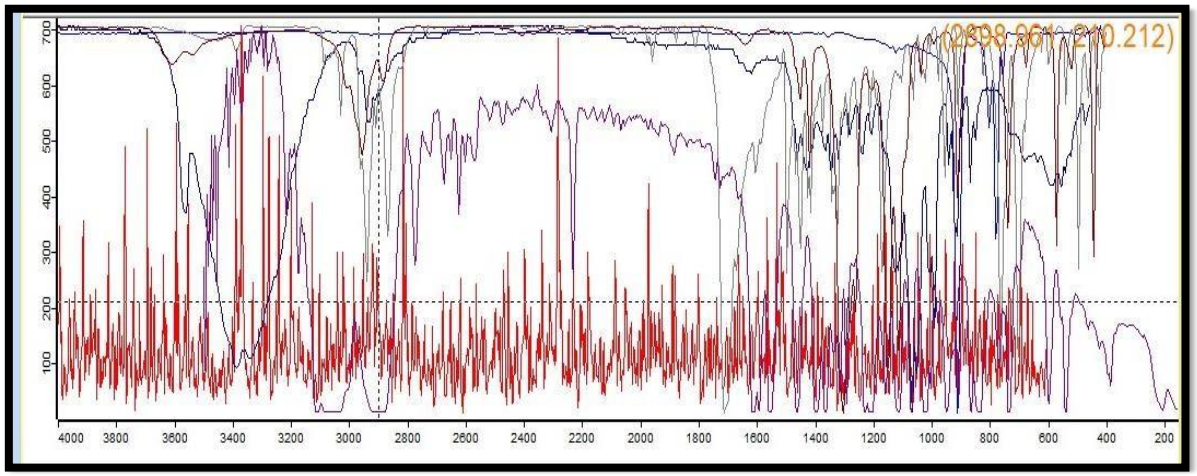
FTIR spectra of the selected formulation were taken and compared with the spectrum pure drug. The Characteristics peaks of the drug were checked in the formulation spectra.

NAOH:



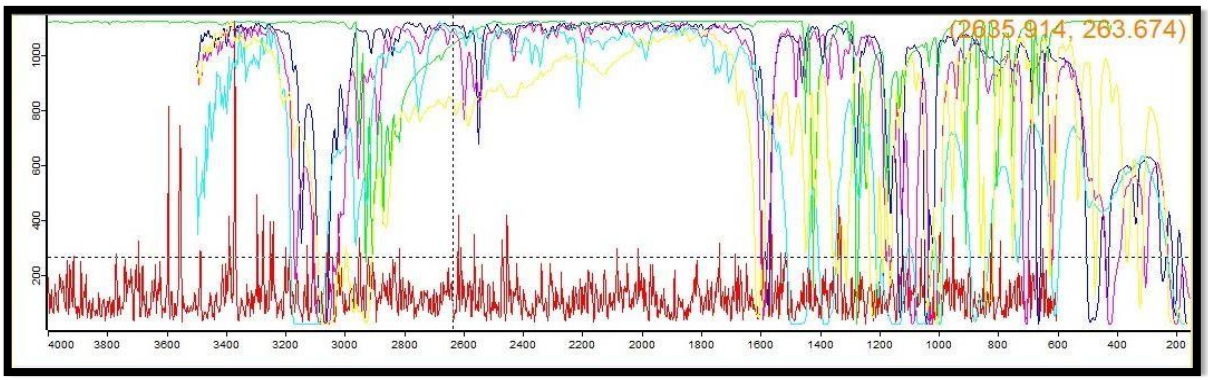
Sr.No.	Functional group	Peak Value	
		Observed Value	Reported value
1.	-OH	1200 - 1480	1200 - 1500

OIL:



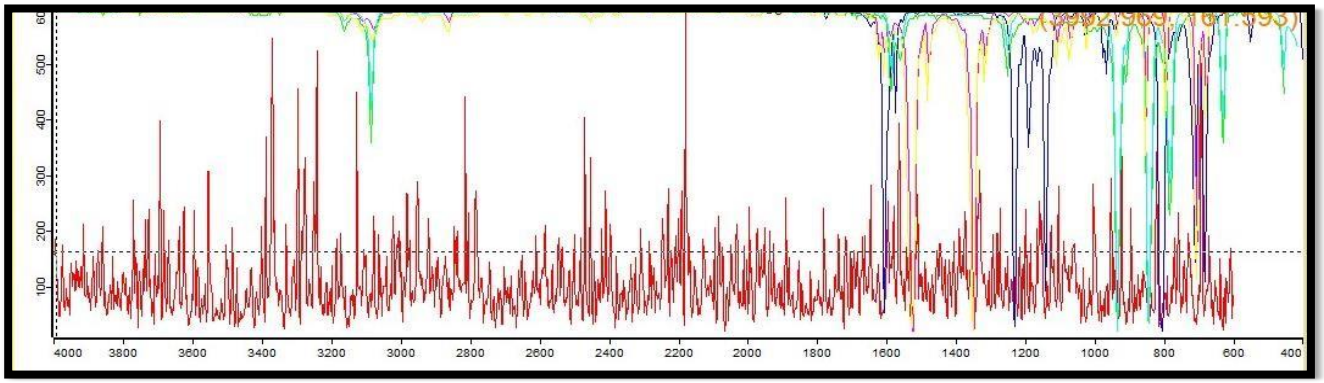
Sr. No	Functional Group	Peak Value	
		Observed Value	Reported value
1.	-COOH	1700 – 1750	1680 -1760
2.	Alkene	3030 - 3070	3010 - 3100
3	Alkane	2850 – 2900	2850 – 2960

SOAP BASE:



Sr. No,	Functional Group	Peak Value	
		Observed Value	Reported Value
1.	-OH	1200 -1460	1200 – 1500

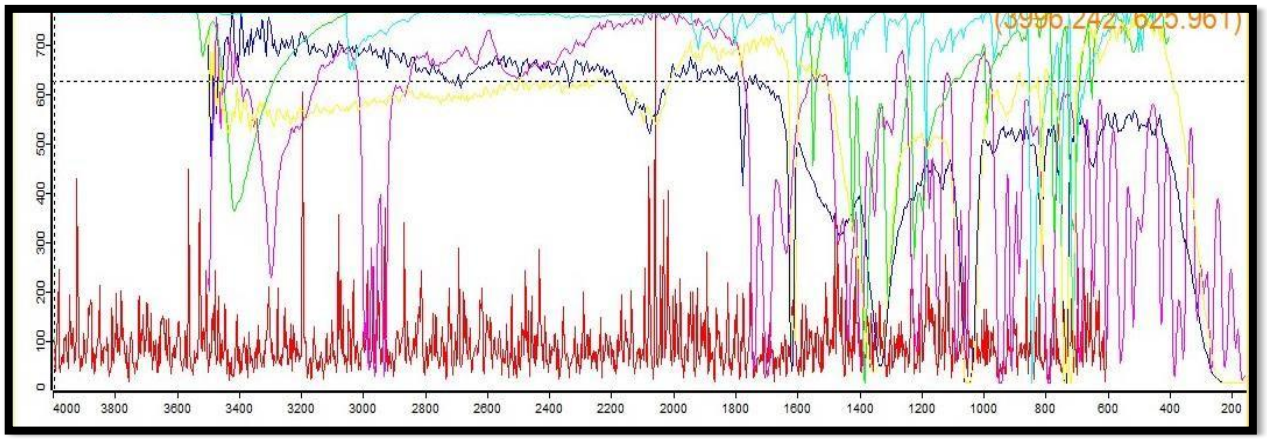
METHYLPARABEN:



Sr. No	Functional Group	Peak Value	
		Observed Value	Reported Value
1.	Ar – OH	2500	2500 - 3000
2.	Ar-CH3	3080	3080
3.	- CH3	1460- 1440	1470 - 1430

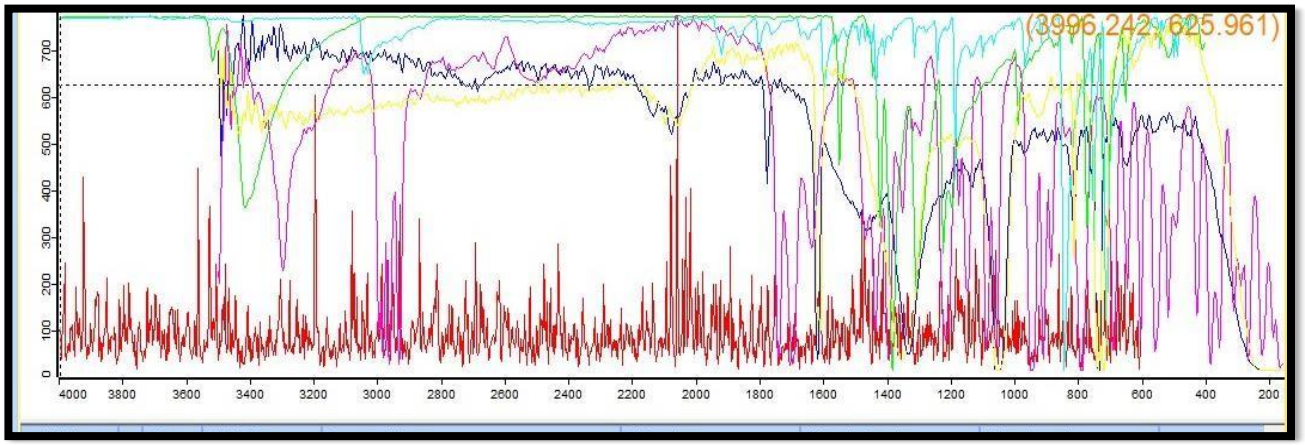
FTIR Result:

Batch No 1:



Sr. No	Functional Group	Peak Value	
		Observed Value	Reported value
1.	-OH	1220-1500	1200 – 1500
2.	-COOH	1680-1740	1680-1760
3.	Alkane	2850-2960	2850-2960
4.	Alkene	3010-3100	3010-3100
5.	Ar-OH	2600-2900	2500-3000
6.	Ar-CH3	3080	3080
7.	-CH3	1470-1430	1470-1430

Batch No 2:



Sr. No	Functional Group	Peak Value	
		Observed Value	Reported value
1.	-OH	1250-1470	1200 – 1500
2.	-COOH	1700-1760	1680-1760
3.	Alkane	2900-2960	2850-2960
4.	Alkene	3050-3100	3010-3100
5.	Ar-OH	2500-3000	2500-3000
6.	Ar-CH3	3080	3080
7.	-CH3	1460-1430	1470-1430

In summary:

8.	Cleansing ability	Good	Good	Good	Good

All types of oils, including different oil mixtures, were used to produce soap. Several qualities of the soap were evaluated. Not every soap-making oil has every characteristic. Because it would be simpler to evaluate, blends of oils are made by combining oils. Oleic acid, palmitic acid, and linolenic acid are the main fatty acids used in soapmaking.Balanites aegyptiaca is the source of them (Desert Date). Saturated fatty acids like linolenic acid aid in the hardening of soap due to their single bond. It facilitates foaming and has a strong clenching agent. Unsaturated fatty acid palmitic acid produces mild soap with high cleansing properties but weak foaming. It has been observed that palmitic acid

REFERENCE

1. Kirtikar KR, Basu BD. Indian medicinal plants. Vol. 1. Allahabad: Lalit Mohan Basu Publications; 1933.
2. Sands, M.J.S., 2001. The desert date and its relatives: a revision of the genus Balanites. Kew Bulletin; 56(1): 1-128.
3. Hall, J.B. and D.H. Walker, 1991. Balanites aegyptiaca; A monograph. School of Agricultural and Forest Sciences Publication, University of Wales.
4. Boesewinkel, F.D., 1994. Ovule and seed characters of Balanites aegyptiaca and the classification of the Linales- Geraniales - Polygalales assembly. Acta Botanica Neerlandica; 43: 15-25.
5. Sheahan, M.C. and M.W. Chase, 2000. Phylogenetic relationships within Zygophyllaceae Based on DNA Sequences of Three Plastid Regions, with Special Emphasis on Zygophylloideae. Syst Bot., 25(2): 371- 384.
6. Singh, K.K., M.M. Das, A.K. Samanta, S.S. Kundu and S.D. Sharma, 2002. Evaluation of certain feed resources for carbohydrate and protein fractions and in situ digestion characteristics. Indian J. Anim Sci., 72(9): 794-797.
7. National Plant Date Centre, NRCS, USDA. Baton Rouge, LA 70874-4490 USA. http://plants.usda.gov.Balanites aegyptiaca.
8. Zarroug IM, Nugud AD, Basir AK, Mageed AA. Balanites aegyptiaca as a mosquito larvicides. Int J Crude Drug Res 1990;28:267-71.
9. Wiesman Z, Chapagain BP. Laboratory evaluation of natural saponins as bioactive agents against Aedes aegypti and Culex pipiens. Dengue Bull 2003;27:168-73