



Research On Formulation And Evaluation Of Polyherbal Antibacterial Soap.

Aniket K. Parkhe^{*1}, Abhishek S. Gadadhe^{*2}, Kartik D. Labade^{*3}, Ruturaj L. Khemnar^{*4}, Ravindra S. Sable^{*5}, Shamli S. Dange^{*6}.

*1,2,3,4,5 Student, Ashvin College Of Pharmacy, Manchi Hill, India.

*6Assistant Professor, Ashvin College Of Pharmacy, Manchi Hill, India.

ABSTRACT:-

This study aims to formulate and evaluate the efficacy of polyherbal antibacterial soap, a soap containing medicinal plants known for their antibacterial properties. The soap was formulated using Aloe barbadensis, Curcuma longa, Apis millifera, and Azadirachta indica in a base of coconut oil and sodium hydroxide. The soap was evaluated for its pH, foaming ability, and antibacterial and antioxidant activity. The formulation and evaluation show promising results in terms of its physical, chemical, and antibacterial properties, suggesting it could be an alternative to conventional antibacterial soaps and contribute to the development of natural products for personal hygiene.

KEYWORDS:- Herbal soap, Aloe barbadensis, Curcuma longa, Apis millifera, Azadirachta indica.

AIM:- The study aims to develop and assess polyherbal soap using natural bases, focusing on its antibacterial activity, patient compliance, and toxicity for antibacterial treatment.

OBJECTIVES:-

The major objectives of the investigation are:-

- Selection of herbal components.
- Standardization of herbal components.
- Preparation of soap base preparation of polyherbal soap by cold process.
- Evaluation of prepared formulation for physical parameters.

1. INTRODUCTION

The skin, the largest organ in the body, regulates body temperature, serves as a blood reservoir, and protects the body from external factors. It is exposed to sunlight, environmental pollution, and pathogens. Common skin disorders include eczema, warts, acne, rashes, psoriasis, and allergies. *Staphylococcus aureus*, a Gramme-positive bacterium, can live on the skin and in the nose and throat, causing infections ranging from minor skin infections to abscesses. It is also a major cause of food poisoning and a leading cause of nosocomial infections. Hand hygiene is crucial to protect the skin from infectious microorganisms and their spread. Chemical antiseptics, such as alcohol-based sanitizers and chlorohexadine products, are available to combat these diseases.

SOAP:- Soap is a mixture of sodium salts of various naturally occurring Fatty acids.

INTRODUCTION FOR SOAP:-

Soaps are long hydrocarbon chains, carboxylate salts made from fat or oil hydrolysis. They are used as surfactants in washing, bathing, cleaning, and textile spinning. Saponification is the process of reacting triglyceride fats with hydrolyzed fats to form free fatty acids, which combine with alkali to form crude soap.

Hydrolysis reaction:-

Fat or oil NaOH Glycerol + Sodium salts of fatty acid..

LITERATURE SURVEY:-

1. Abayeh, O. J, Aina, EA et ul (1998) Soap sodium Salts or potassium salts of stearic acids or any other fatty acids. They are prepared by the saponification process, which in Reacting the oil which contain triglycerides with caustic soda (NaOH) to give the soup However different oils have different Composition of fatty acids which are responsible for different Properties of soaps made out of them is the present work Different types of oil taken.

2. Faicel, R.et al (2008) : Several medical soaps with antiseptic Properties and washing commercial soaps were analyzed to Compare the values on quality criteria for different Characteristics. A comparison of results on the pH, the content of Total fat, free alkalinity/acidity, chloride content, foam height And alcohol insoluble with the quality criteria have shown clear Differences.

3. Chukwulozie po. Et al (2014): antibacterial activity of the Extracts was determined by the disk diffusion assay against *B cereus*, *Styphimurium*, *Saureus* and *Ecoli*. The Folin Cioclieau (FC) assay and the DPPH radicals cavenging ansay Were used to obtain the antioxidant capacity(AOC) and The percentage radical scavenging activity respectively An Antibacterial

liquid soap and an antioxidant liquid soap were Prepared using the adhatoda leaf extracts and the sebio activities Of the prepared medicinal soaps were determined with respect to Their control soaps Furthermore, phytochemical analyses of the Bioactive extracts were carried out to investigate the presence of Different secondary metabolites

4. Aulet de Saab et al (2001): This study aims to check the Antibacterial activity of various branded soaps against bacteria That are normally present in the environment. The proposed Study includes selection of most common bacterial strains from The environment Identification of bacterial strains was done by Standard microbiological techniques, which include gram Staining, biochemical testing and advanced identification by Analytical profile index. Determination of minimal inhibitory Concentration and minimum bactericidal activity of strains was Performed by tube and micro titration method.

5. Warra A. A, Hassan LG Et al (2010): The present study Was carried out to prepare medicinal soaps with antibacterial And/or antioxidant activities using leaf extracts of pomegranate Leaf extracts of pomegranate were obtained by maceration, Soxhlet extraction and sonication using a series of solvents The Extracts were screened for antibacterial activity using the disk Diffusion assay carried out against *Bacillus*, *S. typhimurium*, *Saureus* and *E.coli*. The Folin Cioclteau (FC) and DPPH radical Scavenging assays were used to determine the total antioxidant Capacity (AOC) and the DPPH radical scavenging activity (RSA) respectively

6. A. Oyediran. Et al (2014) Rubber (*Hevea brasiliensis*) Hexane as the solvent, its physical and chemical characteristics Were determined to evaluate its potential as viable 20.75% oil Yield. The rubber seed oil was characterized for peroxide value, acid value. Saponification value, iodine value, flash point, fire point, Kinematic viscosity and refractive index using standard methods. The Results for acid value, saponification value, iodine value, flash Point, fire point, kinematic viscosity, refractive index pH and Specific gravity are 173.29, 189.62, 233.26, 110°C, 115°C.

7. Synthesis and characterization of antiseptic soap from neem oil and shea butter oil Ameh, A. O, Muhammad, J. A and Audu, H. Department of Chemical Engineering, Ahmadu Bello University 24.32 at 40°C and 12.83°C at 100°C, 1.45, 5.89, 0.874 respectively. This indicates that the extra is a potential soap feed stock.

8. University, Zaria Accepted July, 2013 Antiseptic soap, sometimes called antibacterial soap or Anti-fungal soap, is a regular soap in liquid or solid form According to Osborn and Grobe (1982) antibacterial Soaps can remove 65 to 85% bacteria from human skin.

9. Chemical characteristics of toilet soap prepared from neem (*Azadirachta indica* A Juss) seed oil E E Mak-Memah and CK Firempong Department of Biochemistry and Biotechnology, Kwame Nkrumah University of Science and Technology (KNUST) Kumasi Ghana Soap is sodium or potassium salt of fatty acid produced by saponification reaction using sodium or potassium hydroxide Based on its chemical properties as an anionic surface active agent (surfactant), soap is used to clean and wash skin and clothing.

10. A. Oyeditan. Et al (2014) : Rubber (*Hevea brasiliensis*) in hexane as the solvent, its physical and chemical characteristics were determined to evaluate its potential as viable 20-75% oil yield. The rubber seed oil was characterized for pH, acid value, saponification value, saponification value, flash point, fire point, kinematic viscosity and refractive index using standard methods. The Results for acid value, saponification value, saponification value, flash point, fire point, kinematic viscosity, refractive index, pH and specific gravity were 173.29, 189.62, 233.26, 110°C, 115°C 24.32 at 40°C and 12.83°C 100°C, 1.45, 5.89, 0.874, respectively. This indicates that the extract has a potential soap feed stock. The quantity of oil added per batch. The soaps were characterized for foam capacity, foam stability, Hardness and pH and compared with that produced for oil palm values of 9.63 and 10:52 for PKO and RSO soap were obtained which is within the acceptable range.

METHODOLOGY MATERIAL AND TECHNIQUES USED:

ALOE VERA:-

Aloevera, a plant known for its antioxidant properties, aids in sunburn treatment by promoting healing at the epithelial level of the skin. It acts as a protective layer, replenishing moisture and promoting faster skin healing. Aloe vera gel contains Auxin and Gibberellins, which provide wound healing and anti-inflammatory properties. Gibberellin stimulates cell growth, allowing skin to heal quickly and naturally with minimal scarring. Aloe vera is ideal for those with oily complexions.

TURMERIC:-

Turmeric contains antioxidants and anti-inflammatory components. These characteristics may provide glow and luster to the skin. Turmeric may also revive your skin by bringing out its natural glow. The curcumin found in turmeric can help wounds heal by decreasing inflammation and oxidation. It also lowers the response of your body to cutaneous wounds. This results in your wound healing more quickly.

HONEY:-

"With its moisturizing and soothing effects, raw honey can hydrate the skin, leaving it soft, radiant, and glowing. Honey is a great wound healer. Honey in particular works well for this as it is an anti-inflammatory which can help reduce redness and swelling of pimples, says Engelman, and its antibacterial properties can help fight acne-causing bacteria.

NEEM:-

The use of neem oil in general skincare or treatment for skin conditions of the available research into medicinal uses of neem. Concluded that its extracts can help treat a variety of skin conditions, including. The antibacterial properties of cosmetic products containing neem

compounds The authors found that soaps containing Extracts of neem lea for neem Prevent the growth bacteria.

INGREDIENTS	QUANTITY	USES
Soap base	80gm	For Soap Making
Aloevera gel	5gm	Anti-ageing
Neem oil	5gm	Anti-bacterial
Turmeric	2gm	Anti-bacterial
Honey	5gm	Anti-ageing, Anti-bacterial
Rose oil	5drops	Flavouring agent

PROCEDURE FOR SOAP :- To prepare herbal soap by adding all ingredients is 80.6gm with SLS. Take all ingredients as per formula table. Weigh accurately 80gm of soap base. Boil in beaker at the end of solid to liquid. Add all ingredients in boil soap solution and stir upto will mix. Solution poured in suitable mold. Keep the mold in refrigerator at 2 to 4 hours.



Figure :- Prepared Polyherbal Antimicrobial Soap.

EVALUATION TEST:-

- 1) **PH TEST:-** Soap phare observe dis 7.3 and ph adjustment HCL is added 6 drops then ph is adjusted.
- 2) **FOMING TEST:-** Foam are observed with in 10 sec.
- 3) **PHYSICAL PARAMETERS:-** Clarity and color was checked by naked eyes against white background, the odour was smelled.
- 4) **PH:-** The pH of all the prepared formation was determined by using digital pH meter. The formulations were dissolved in 100 ml of distilled water and stored for two hours. The measurement of pH of formalation was done in previously calibrated ph Meter.

- 5) **ACCELERATED STABILITY TESTING** :- Accelerated stability testing of prepared PHF was Temperature, studied for one week at $50\text{ C}^{\circ}+1\text{ C}^{\circ}$ for 3 months .The PHF were kept both at room and elevated temperature. Determination of percentage free alkali; About 5 grams of sample was taken in a conical flask and added To it into 50ml of neutralized alcohol. It was boiled under reflux On water bath for 30minutes, cooled and 1ml of ph enaphthale in Solution was added it was then titrated immediately with 0.1N HCL.
- 6) **FOAM HEIGHT**:- 0.5 grams sample of soap was taken dispersed in 25 ml Distilled water. Then, transferred it in 100ml measuring Cylinder, volume was make up to 50 ml with water. 25 strokes Were given and stand till volume measured upto 50 ml And measured the foam height, above the aqueous volume.
- 7) **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 valune of foam at 1 minute Intervals for a 4 minutes was recorded. Alcohol Insoluble Matter 5gm of sample was taken in a conical flask. Added at 50 ml of Warm ethanol and shaken vigorously to dissolve the solution was Filtered through a tarred filter paper with 20 mi warm ethanol And dried 105 C° for one hour. The weight of dried paper was taken.
- 8) **FORMULA**:- Percentage alcohol in soluble matter = Weigh to the Residue *100/Weigh to sample.

PARAMETER:

Sr.no	Chemical Parameter	Standard
PH	7.3	6.5-7.5
FOAM	Within 10 sec foam are observed.	10 sec.

RESULT:-

The physicochemical parameters of the soap were determined, including color, odor, appearance, and pH. The formulations showed good appearance and a desired PH of 7.0. Other parameters like percentage-free Akalie, foam height, foam retention, alcohol-soluble matter, and high temperature establiity were also assessed, confirming the results.

CONCLUSION:-

Polyherbal soaps were prepared using the cold process technique, resulting in a product with good compatibility and good physical characteristics. The formulations were found to be free from particles and alkali components, providing excellent foaming properties. Microbiological studies showed antimicrobial properties, and antioxidant studies showed superior anti-aging

properties compared to the marketed formulation. The study concludes that polyherbal can be effectively formulated into soap using a cold process technique, offering excellent anti-ageing properties.

REFERENCE:-

- 1) Tortora G.J, Grabowski S.R, Principles of Anatomy and Physiology 10th edition published by John Wiley and Sons.
- 2) Grace X. F, Sowmya K.V, Darsika C, Polyherbal Hand Sanitizer-Formulation and Evaluation, Indian Journal of Pharmacy and Pharmacology.
- 3) Sunhya R, Peter I.S, Chang H.S , Hyeonsook C, Yoonkyung P, Colonization and Infection of the skin by S. Aureus Immune System Evasion and the response to Cationic Antimicrobial peptides, International Journal of Molecular Science, Published on.
- 4) Choudhari S, Sutar M, Chavan M, Formulation ,Evaluation and Efficiency of Herbal Handwash Indo American International Journal of Pharmaceutical Research.
- 5) Saad A. H, Gamil S. N, Kadhim R B, Samour R, Formulation and Evaluation Of Herbalhand Wash From Matricariachamomilla Flowers Extract International Journal of Research in Ayurveda and Pharmacy.
- 6) Sahu RK, Roy A, Matlam M, Deshmukh VK, Dwivedi J, Jha AK. Review on Skin aging and compilation of scientific Validated medicinal plants, Prominence to flourish a better Research reconnoiters in herbal Cosmetic.
- 7) Mackiewicz Z, Rimkevicius A. Skin aging Gerontologija 2008.
- 8) Aswal A, Kalra M, Rout A, Preparation and Evaluation of Polyherbal Cosmetic Cream. Pharm Lett 2013.
- 9) Arora N, Agarwal S, Murthy RSR. Latest technology Advances in cosmaceuticals. Int JP harm Sci Drug Res 2012.
- 10) Rattan SI. Hormetinsas novel Components of Cosmeceuticals aging interventions Cosmetics 2015.
- 11) Verma A, Gautam SP, Devi R, Singh N, Singh HL. Cosmeceuticals; Acclaiming its most fascinating position in personal care industry.
- 12) Dureja H, Kaushik D, Gupta M, Kumar V, Lather V. Cosmeceuticals An emerging concept Ind JPharmacol 2005.
- 13) Abayeh, O.J, Aina, E.A and Okuonghae Oil Content and Oil Quantity Characteristics Of some Nigerian oil seeds. Jou Cosmetic Pure and Applied Sciences 1998.
- 14) Faicel R, Baati R, Damak N, Kamoun A, Chaabouni M: J Am Oil Chem Soc 2008.
- 15) CHUKWULOZIE PO, CHUKWUEMEKADE , CHINWEOL & JUDEES. Optimization of a soap Production Mix Using Response Surface Modeling: A Casev Of Niger Bar Soap Manufacturing Industry Onitsha, Anambra State, Nigeria. International Journal Of Scientific and Technology Research 2014.

