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**FORMULATION & EVALUATION OF CONSUMER-FRIENDLY POLY  
HERBAL HAND WASH****PATEL JK\*, PATEL D, PATEL VK, PATEL R, PARIKH S AND YADAV P**

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This study aimed to create a new polyherbal hand wash gel that uses Neem and Tulsi extracts, along with other herbal drugs, to promote hand hygiene and prevent the growth of bacteria while minimizing skin irritation. Various parameters, including colour, fragrance, pH, viscosity, foam height, antimicrobial activity, and skin irritation test, were evaluated to assess the hand wash's efficacy. The results were compared to those of commercially available hand wash, and the polyherbal hand wash was found to be a better alternative to plain soap and synthetic hand wash due to its effectiveness and suitability for all skin types. The study highlights the potential of herbal medicine in developing safe and effective hygiene products, which can help improve public health and reduce the use of harmful chemicals in personal care products. In summary, the development of a polyherbal hand wash gel that is both safe and effective demonstrates the potential of natural remedies in addressing public health challenges.

**Keywords: Polyherbal hand wash, Neem extract, Tulsi extract, Antimicrobial activity, Skin irritation, Herbal medicine**

**INTRODUCTION:**

Hand washing with soap and water has been taken part of personal hygiene for hundreds of years and has been usually embedded in spiritual and cultural behaviour [1]. Although, the link among Hand washing and the spread of disease changed into set up

simplest two centuries in the past, despite the fact that this can be considered as extraordinarily early with admire to the discoveries of Pasteur and Lister that passed off decades later [2]. In 1847, observations of Semmelweis concluded that after

performing autopsies by physician on their hands had a disagreeable odour despite hand washing with soap and water before entering the clinic. In 1980s remarkable evolution made in concepts of hand hygiene in healthcare.

It is important to wash your hands at specific times, such as after using the toilet, before, during, and after preparing food, and between handling raw and cooked or ready-to-eat food. Additionally, washing your hands before eating and after blowing your nose, coughing, or sneezing can help prevent the transmission of germs. It is also important to wash your hands before and after attending to sick children or other family members, after smoking, after handling rubbish or working in the garden, and after handling animals. Finally, washing your hands when you arrive at home, other people's homes, venues, or work, and after changing nappies is also crucial for maintaining good hand hygiene [3].

To properly wash your hands, you should wet them with clean, running water and turn off the tap. Then, apply hand wash and lather well for at least 20 seconds, making sure to cover all surfaces of your hands and wrists, including the back of your hands, between your fingers, and under your fingernails. If you wear rings or watches, it is best to remove them or ensure that you wash under them to eliminate any microorganisms that may be present. Once you have lathered

thoroughly, rinse your hands well under running water and make sure to remove all traces of soap [4]. To dry your hands, use a clean towel or air dry them. If using a towel, it is best to use a paper towel or single-use cloth towel, and make sure to dry under any rings to prevent future contamination [5]. Hot air dryers can also be used as an alternative drying method [6]. By following these simple steps, you can help prevent the spread of germs and maintain good hand hygiene. pH of skin is 4 to 5.6. The skin composed of 3 layers: Epidermis, Dermis, and Subcutaneous Tissue [7, 8].

The use of hand wash products can provide several benefits. Firstly, the formulation of hand wash can be designed to minimize costs and packaging size, making it more accessible and affordable for consumers. Additionally, the use of preservatives can prolong the shelf life of hand wash products, ensuring they remain effective and safe to use. Hand wash products are also convenient to carry during travel, making them an ideal hygiene solution for people on the go. Using hand wash products that are free from harmful chemicals can improve consumer satisfaction, and the natural ingredients present in herbal hand wash products can improve skin health without any side effects. Overall, the use of hand wash products can promote personal hygiene, improve skin health, and provide a convenient and affordable solution for consumers.

**MATERIALS AND METHODS:****MATERIALS:**

The materials used in this study were carefully selected based on their known medicinal properties and traditional use in various cultures. Neem, Tulsi, and Pudina are herbs commonly used in Ayurvedic medicine for their anti-inflammatory, anti-bacterial, and anti-fungal properties. Clove

oil is known for its analgesic and anti-microbial effects. Aritha powder is a natural surfactant and has been traditionally used as a cleanser. Turmeric is a spice with anti-inflammatory and anti-oxidant properties. These ingredients were used in various combinations and concentrations to prepare herbal formulations for the evaluation of their efficacy in treating skin.

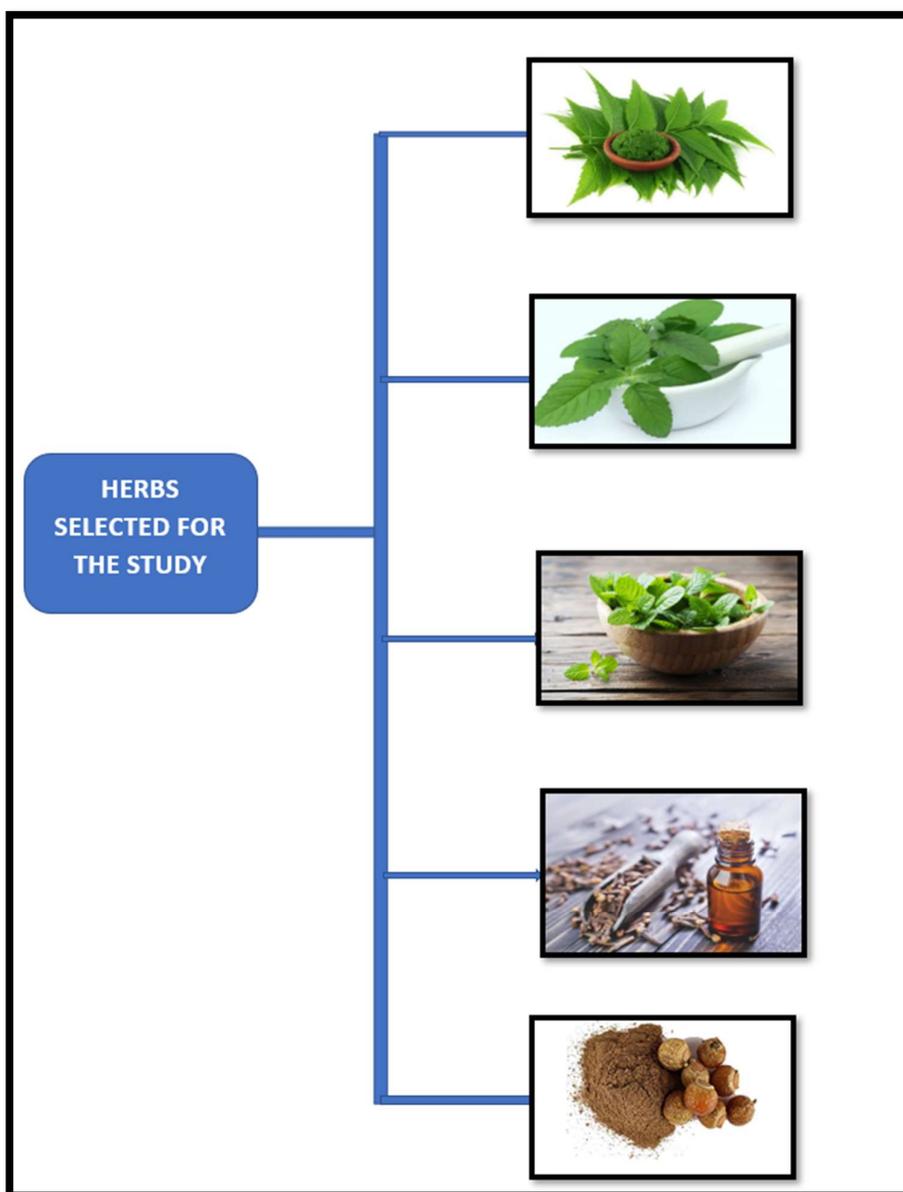


Figure 1: Selection of Herbs

**METHOD:**

Polyherbal hand wash gel was prepared using Carbopol 940 as gelling agent which is soaked in 15ml distilled water overnight. Neem and peppermint extracts, Aritha powder along with Tulsi and clove oil were measured accurately and dissolved by gentle heating. After heating, keep the solution aside for sometimes. The required quantity of sodium lauryl sulphate dissolved in 10ml distilled water along with glycerine were mixed in above aqueous phase with continuous stirring.

The methyl paraben was dissolved in remaining quantity of purified water and dispersed into the extract. The swelled polymer was stirred using a mechanical stirrer to ensure the uniform dispersion of polymer and finally added into the above mixture to form a homogenous gel and then there required quantity of rose oil was added for fragrance and turmeric also added for colorant. Lastly, it was stored in well closed container and labelled suitably for further analysis [9].

**Table 1: Formulation Table**

Sr.no.	Ingredients	Quantity (gm/ml)	Uses
1	Neem	5	Antimicrobial Agent
2	Tulsi	5	Purifying Agent
3	Pudina	2.5	Antibacterial Agent
4	Clove oil	0/25	Antibacterial Agent
5	Aritha	2.5	Foaming Agent
6	SLS	1.5	Foaming Agent
7	Carbopol 940	2.5	Gelling Agent
8	Methyl paraben	0.25	Preservative
9	Glycerine	1.25	Softening Agent
10	Rose oil	QS	Perfume
11	Distilled water	Up to 50ml	Vehicle
12	Turmeric	QS.	Colourant

**EVALUATION PARAMETERS:****Table 2: Evaluation Parameters**

I.	Organoleptic evaluation
II.	Appearance and homogeneity
III.	Grittiness
IV.	Skin irritation test
V.	PH
VI.	Spread ability
VII.	Viscosity
VIII.	Foam height
IX.	Stability
X.	Antimicrobial study of herbal handwash

**I. Organoleptic evaluation**

Parameters like colour, odour, texture was carried out colour and texture were evaluated by visual and touch sensation respectively. The odour was inspected by sensing the formation.

**II. Appearance and homogeneity**

Appearance and homogeneity were evaluated by visual inspection.

**III. Grittiness**

1ml of gel was taken on finger tips and rubbed between two finger tips then the formulation was evaluated

**IV. Skin irritation test**

Skin irritation test was evaluated by applying poly herbal hand was gel on skin and left for 30 min, after 30 min of washing observe any itching, rashes or redness on skin by sensory and visual inspection

**V. pH**

1gm of sample of poly herbal hand wash gel was taken and dissolved it into 100ml distilled water. The pH solution was measured by standardized digital pH meter.

**VI. Spread ability**

5. gm of sample of poly herbal hand wash gel was pressed between two slide and left for about

5 min where no more spreading was expected. Diameter of spreaded circle was measured in cm and was taken as comparative values for spread ability

**VII. Viscosity**

The viscosity of poly herbal hand wash gel was determined by using Ostwald viscometer

**VIII. Foam height**

One gram of sample of poly herbal hand gel was taken and dispersed in 50ml distilled water.

Dispersion was transferred in to measuring cylinder. Volume was made up to 100ml with water. This solution is taken in 10 test tubes in series of successive portion of 1,2,3.....10ml and remaining volume is made up with water to 10ml. Then the test tube was shaken for 15 seconds. And the height of foam was measured

**IX. Stability**

The stability studies were carried out for poly herbal hand wash gel formulation by storing at different temperature conditions like 40 c, 25 c and 37 c for 1 week. During the stability studies no changes in colour and no phase separation were observed in the formulated hand wash.

**X. Anti microbial study of poly herbal hand wash**

The screening of anti-microbial efficacy of the formulated poly herbal hand wash was performed on soil microbes by using agar plate method as per standard procedure. Two sterile petri plates were taken for testing the anti-microbial activity against soil microbes. The plates were filled with nutrients agar solution and allowed for solidification. After solidification the soil

extract from the subculture were poured into the nutrient agar media by pour plate method and inoculated for 24 hours. After 24 hours

of inoculation two cavities were made in it by cup plate method.

### RESULT:

Table 3: Result of Evaluation parameters

S. No.	EVALUATION PARAMETER	FORMULATED POLYHERBAL HAND WASH
1	COLOR	LIGHT BROWN
2	ODOUR	ROSE LIKE
3	TEXTURE	SMOOTH
4	APPEARANCE AND HOMOGENESITY	TRANSLUCENT
5	GRITTIENESS	NON-GRITTY
6	SKIN IRRITATION TEST	NO IRRITATION
7	PH	7.40
8	FOAM HEIGHT	10ML
9	STABILITY	STABLE
10	DIRT DISPERSION	LIGHT

### CONCLUSION:

Like Cosmetics, Cosme ceuticals (A cosmetic that has or is claimed to have medicinal properties) are topically applied but they contain ingredients that influence the biological functions of skin. The WHO estimates that 80% of the population of Asian country presently use herbal medicine for primary aspect of primary health care and for the purpose of hand hygiene includes preparation of Hand wash. The present study was carried out to formulate Poly herbal Hand wash Gel containing herbal extract which is used not only for the purpose of cleaning hands but also for the prevention of bacterial growth. Its composition was prepared according to delicateness of skin so that it cannot cause any type of irritation. Hence, it can be concluded that the Polyherbal Hand wash Gel are much better than plain soaps or existing marketed synthetic hand wash due to their ingredients

and effectiveness on our skin of hands and as well as suitable for all type of skin.

### REFERENCES:

- [1] Rotter M. hand washing and hand disinfection. In: Mayhall CG, ed. Hospital epidemiology and infection control, 2nd ed. Philadelphia, PA, Lippincott Williams & Wilkins, 1999: 1339- 1355.
- [2] Jumaa PA. Hand hygiene: simple and complex. International Journal of Infectious Diseases, 2005, 9: 3-14.
- [3] Simmons BP. Guidelines for hospital environmental control. Section1. Antiseptics, hand washing, and hand washing facilities. In: Centres for Disease Control and Prevention (CDC), ed. CDC Hospital infections program (HIP) guidelines for prevention and control of nosocomial infections. Atlanta, GA, Springfield, 1981: 6-10.

- [4] Bjerke NB. The evolution: hand washing to hand hygiene guidance. *Critical Care Nursing Quarterly*, 2004, 27: 295-307.
- [5] The Healthcare Infection Control Practices Advisory Committee (HICPAC). Recommendations for preventing the spread of vancomycin resistance. *Infection Control and Hospital Epidemiology*, 1995, 16: 105-113.
- [6] Garner JS, and the Healthcare Infection Control Practices Advisory Committee. Guideline for isolation precautions in hospitals. *Infection Control and Hospital Epidemiology*, 1996, 17: 53-80.
- [7] The skin "boundless anatomy and physiology [online]. Available: <https://courses.lumenlearning.com/boundless-ap/chapter/the-skin/#:~:text=The%20epidermis%20is%20a%20thin,divided%20into%20five%2C%20separate%20layers.>
- [8] Shaloo, Shayna Shafi, Simran Singh, Shashi Verma, Ritesh Kumar Tiwari and Devika Tripathi, Formulation and Development of Mint containing Herbal Hand Sanitizer, *European Journal of Pharmaceutical and Medical Research*, 2017 [11], 454-457.
- [9] Powar P. V, Bhandari N. R, Arya Ashwini, Sharma P. H., Formulation and Evaluation of Poly Herbal Anti - Bacterial Gel Based Hand Wash, *International Journal of Pharmaceutical Sciences Review and Research*, 33 (1) July – August 2015; ArticleNo.16, Pages: 79 - 82.