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Review on the Formulation and Evaluation of Polyherbal Hand Wash Gel

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A B S T R A C T

The preparation of the polyherbal hand wash gel is primarily done for hand hygiene. In the field of medicine, herbal remedies play a vital role. Herbal remedies have been widely used as effective preventative measures and treatments for a variety of illnesses. Therefore, herbal medicine is often referred to as phytomedicine or botanical treatment. There are a lot of hand washes on the market that have the potential to cause negative side effects, such as irritation, dermatitis, and itching. Using neem extract (which has antimicrobial properties) and Tulsi (which has purifying properties). An effort has been undertaken to develop a polyherbal hand wash that protects your skin from disease-causing bacteria and organisms.

The composition of the polyherbal hand wash comprises Tulsi and Neem, as well as a few other herbal remedies or herbs that will be discussed later. Colour, scent, grittiness, pH, viscosity, spreadability, foam height, and foam retention Herbal hand washes are evaluated using factors such as skin irritation, foam height, foam retention, cleansing performance, dirt dispersion, and antimicrobial activity, among others.

Its efficacy was investigated and compared to that of the marketed hand wash. The results revealed few or no harmful effects and were within acceptable limits. The current study aimed to create a polyherbal hand wash gel that incorporates herbal extract and may be used to clean hands while also inhibiting bacteria growth. Its composition was designed with the delicateness of skin in mind to avoid discomfort. As a result, based on the ingredients and how effectively they function on our hands, as well as the fact that they are safe for all skin types, Polyherbal Hand Wash Gel outperforms other synthetic hand washes on the market today.

Keywords: Herbal remedies, Foam height, Hand washes, Hand hygiene, Skin.

1. Introduction

Since ancient times, washing your hands with soap and water has been an element of personal hygiene [1], [2] and is typically ingrained in cultural and spiritual practices. However, in comparison to Pasteur and Lister's results, which were published decades later, the link between hand washing and disease transmission was recognized as early as two centuries ago. In the middle of the nineteenth century, Oliver Wendell Holmes in Boston, Massachusetts, and Ignaz Semmelweis in Vienna, Austria, discovered that healthcare workers' hands might spread nosocomial illnesses. Even though they had washed their hands with soap and water before entering the clinic, Semmelweiss' observations in 1847 led him to the conclusion that doctors' hands had a terrible odor after performing autopsies. He so proposed that childbed fever was caused by "cadaverous particles" distributed through the hands. Following his death, Semmelweis' discoveries gained international attention as Pasteur developed the scientific theory of disease, which provided a theoretical explanation for Semmelweis' observations. The concept of hand hygiene in healthcare underwent a significant transformation in the 1980s. The first national hand hygiene guidelines were released in the same year, and several other nations also released new rules in this category. The CDC/HICPAC in the United States suggested in 1995 and 1996 that hand washing be done with an alcoholic antiseptic agent or antimicrobial soap.

Figure 1: Representation of Herbal handwash (Authors used biorender to draw this)

2. Materials and Methods

2.1 Collection of plant material

The leaves of peppermint (Mentha piperita) and neem (Azadirachta indica) were collected from the Gurukrupa Institute of Pharmacy College campus in Majalgaon. Wash the sample well with fresh water to remove any sand particles. For four to five days, the plant material was exposed to sunlight to dry. The dried plant material was then crushed and sieved to create an amor-phous powder that was nearly fine. A suitable solvent was utilized to extract the powdered material. [8], [9]. We gathered tulsi oil, clove oil, turmeric powder, and ritha powder from the Majalgaon local market. The antimicrobial characteristics of soil extract influenced its selection.

2.2 Plant material extraction

Involved combining 10 grams of dry plant material (Neem, peppermint powder, and Ritha powder) with 5 grams of water. To get the particle-free extract, the mixture was heated over a water bath to 600 degrees Celsius for an hour before being filtered using Whatman Filter Paper. [8], [10]

3. Method of Preparation

1) Carbopol 940, a gelling substance soaked in 15 milliliters of distilled water overnight, was employed in the Gel for Polyherbal Hand Wash.
2) The Tulsi, clove oil, neem and peppermint extracts, and Ritha powder were properly measured and dissolved with gentle heat. After heating the solution, let it cool for a bit.
3) Glycerin and sodium lauryl sulphate were added to the aqueous phase and agitated continuously. The combination contained 10 milliliters of distilled water.
4) The remaining filtered water was used to dissolve the methyl paraben, which was then spread throughout the extract.
5) To ensure uniform dispersion, the swelling polymer (Carbopol 940) was stirred with a mechanical stirrer before being introduced to the liquid to form a homogeneous gel.
6) The appropriate amount of rose oil was then applied for aroma.
7) The sample was properly labeled for further analysis and stored in a sealed container.

4. Evaluation parameters of polyhedral hand wash gel

The following evaluation standards were used on the prepared Polyherbal Hand Wash Gel formulation:

1) Viscosity was evaluated using a viscometer. Organoleptic factors tested included color, texture, and odor. The senses of touch and sight were utilized to evaluate texture and color, respectively. The odor was tested via formulation sensing.
2) Visual examination was performed to assess appearance and uniformity. Grittiness: The formulation was assessed after applying 1 milliliter of Gel to the tips of two fingers and rubbing them together.
3) Skin Irritation Test: Polyherbal Hand Wash Gel was applied to two distinct locations of the skin for half an hour. Next, evaluate the skin for redness, rashes, or itching using both visual and sensory means.
4) To determine the pH, 1g of Polyherbal Hand Wash Gel was dissolved in 1g of distilled water. The pH of the solution was measured with a standardized digital pH meter.

5) Spreadability: After five minutes of pressing 0.5 grams of Polyherbal Hand Wash Gel between two slides, there was no further spreading expected. The diameter of the spread circle, measured in centimeters, was used to calculate Polyherbal Hand Wash Gel's spread ability.

6) To test foam retention, add 25 ml of Polyherbal Hand Wash Gel to a 100 ml measuring cylinder and shake ten times. For four minutes, the foam volume was monitored at one-minute intervals. The foam should take at least five minutes to stabilize.

7) Stability testing: The Polyherbal Hand Wash Gel formulation was stored for a week at various temperatures, including 40°C, 25°C, and 37°C. The prepared hand wash exhibited no phase separation or color change throughout the stability testing.

5. Antimicrobial Study

In accordance with usual practice, the antimicrobial efficacy of the prepared Polyherbal Hand Wash Gel was screened onuse the agar plate technique. Two sterile petri dishes were gathered in order to assess the antibacterial effectiveness against soil microorganisms. The nutrient agar solution was added to the plates, and they were left to solidify. Following solidification, the subculture's soil extract was transferred It was infected for a whole day in the nutrient agar medium using the Pour Plate Method. After a 24-hour inoculation period, two cavities were made in it using the Cup Plate Method.

6. Future scope

Nowadays, a great number of chemical hand washes are offered as alcohol-based sanitizers with a variety of synthetic detergents. Alcohols and detergents help to reduce the spread of harmful infections associated with healthcare, but they also have some downsides and detrimental effects on the environment and human tissues. Regular use of formulations containing synthetic chemicals may induce skin irritation and promote infection resistance. Because these synthetic formulations include additional synthetic chemicals and alcohols, their production costs are also high. Natural components must be employed instead of synthetic ones to address these difficulties.

Natural ingredients do not harm the environment or human skin. Herbal hand wash could be an innovative way to combat antibiotic-resistant pathogenic organisms while also promoting safe, healthy, and natural living through germ-free hands. Furthermore, because these plants are widely available in the environment in vast quantities and can be easily cultivated, herbal formulations have been found to be more cost-effective than synthetic compounds and can reduce manufacturing

7. Conclusion

In conclusion Cosmeceuticals, which are cosmetics with or purported to have therapeutic qualities are topically administered and comprise substances that affect the skin's biological processes. According to the World Health Organization 80% of Asian countries' populations currently utilize herbal medication for primary healthcare purposes, including making hand wash. The objective of the present study was to create a polyhedral hand wash gel that contains herbal extract and is used to both clean hands and stop bacteria from growing.

In order to prevent any kind of irritation, its composition was developed with the delicateness of skin in mind. Therefore, based on the ingredients and how well they work on our hands, as well as the fact that they are safe for all skin types.

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