WWW.IJRPR.COM

International Journal of Research Publication and Reviews

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

"FORMULATION AND EVALUATION OF HERBAL HANDWASH USING NEEM AND REETHA EXTRACT"

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ABSTRACT :

Hand washing is essential for food preparation and serving, as well as for residences, daycare centers, and hospital settings. The current study's objective was to create poyherbal handwash formulations using extracts of Ocimum sanctum (tulsi) and Azadirachta indica (neem) leaves.

The present research was carried out by using antifungle and antimicrobial agent such as neem and tulsi ,flavouring agent like orange oil ,healing agent alovera gel , foaming agent reeta and sodium lauryl sulphate,cooling agent eucalyptus oil and moisturizing like glycerin.

formulations of hand wash were prepared and the formulations were evaluated for physical properties like appearance, pH,

irritanctest,stability,homogeneity,washability, grittiness,foam retention,foaming capacity and foam height.

INTRODUCTION

Definition

Since our skin is the area of our body that is most exposed, it needs to be protected against skin infections. The main way that infections and multidrug-resistant organisms are spread to patients is via the hands of healthcare workers (HCWs). Thus, it raises the issue of using antiseptics for handwashing. Many chemical antiseptics are currently marketed as alcohol-based sanitizers, products containing chlorhexidine, etc.

These soaps or solutions have some drawbacks or negative effects, but they aid in more successfully reducing the spread of infectious illnesses linked to medical treatment. Frequent usage might cause skin irritation and make them resistant to infections. Skin pathogens include bacteria including Proteus vulgaris, Klebsiella pneumonia, Pseudomonas species, and Staphylococcus aureus. Hand cleaning reduces the quantity of dangerous bacteria on hands and gets rid of apparent filth,

Salmonella and E. Coli are two examples of harmful bacteria and viruses that may spread to food via humans, animals, or equipment. Only a few publications on the inhibitory action against certain pathogenic bacteria and fungi are known, and the antimicrobial qualities of several Indian medicinal herbs were described based on folklore. The use of plants as medicine has been practiced for generations and is a significant part of India's healthcare system. Since the majority of practitioners in these Indian medical systems create and administer their own recipes, appropriate documentation and study are necessary.

Phytomedicine or botanical therapy are other names for herbal medicine. Any use of a plant's seeds, roots, leaves, bark, flowers, or aerial parts for therapeutic purposes is referred to as herbal medicine. Herbal medicine has been used to treat a wide range of illnesses. Since our skin is the most exposed area of our body, it needs to be protected against skin infections.

The most crucial, easiest, and least costly way to avoid nasocomial infections is to practice good hand hygiene. The primary goal of hand washing is to keep hands clean by eliminating dirt, grime, and harmful bacteria while preventing the spread of transitory microbes. In its most basic form, hygiene is the scientific field that deals with the understanding and application of health promotion. The idea emphasizes how important it is to maintain hygiene in order to avoid illness.

Hygiene habits may stop the spread of infections, whether they are bacterial or viral. A natural medication therapy promotes good health. It was widely utilized to offer ordinary and first-line healthcare. Herbal therapy has been used to treat and cure a variety of illnesses in India since ancient times. Herbal

remedies may be used to heal wounds, alleviate inflammation brought on by infections, treat skin lesions, leprosy, diarrhea, scabies, and treat venereal diseases including snake bites and ulcers. A good source of antimicrobial activity has been found in plants, and plant extracts may be used as antimicrobial compounds to combat a variety of pathogenic bacteria that cause infections, diseases, and medication resistance. Since ancient times, people have used herbal cosmetics to enhance their appearance. Its absence of adverse effects makes it the finest option for skin and hair care. It is becoming more and more well-known worldwide every day.

Following Are The Some Advantages Of Using Natural Cosmetics :

1.1.1. ***Safe to use:-***

Compared to the beauty products Natural cosmetic are safe to use.They are hypoallergenic, and tested and proven by dermatologist to be safe to use anytime.

1.1.2. ***No side effects:-***

The synthetic beauty product can irritate skin and cause pimples they might block skin pores and make skin dry or oily.

1.2.3 Animal testing not required:-

To make some cosmetics safe and effective for human use, they are first tested on animals. But natural cosmetics don't have to be tested on animals.These natural formulation are tested by experts in laboratories using are equipment with no animal involved.

1.1.3. ***Natural products:***

Herbal cosmetics, as the name implies, are natural and devoid of artificial ingredients that may otherwise be harmful to the skin. Instead of traditional synthetic products, different plants extract are used in these products. Eg. Aloe-vera gel and coconut oil.

1.1.4. ***Inexpensive:***

Natural cosmetic are not that expensive. in fact, some of these products are more affordable than synthetic ones. an estimates of demonstrated about 80% of world population depends upon natural products for their health care.

1.1.5. ***Compatible with skin type:-***

All skin types, whether fair or dark, may use natural products. Regardless of skin tone, natural cosmetics such as lipstick, eye shadow, and foundation are safe to use.

Additionally, it aids in the resolution of fungal and antiseptic skin issues.

1.3. *Benefits of using herbal hand wash*

Herbs are readily available in both urban and rural settings, making it simple for everyone to use them Affordable: Herbal plants are less expensive than the chemical components found in synthetic hand wipes

AIM AND OBJECTIVE

Aim

Organisms are known to thrive and proliferate on human hands, which gives them the chance to infect the host or other people. On the skin's surface, hand washing decreases the presence of transitory organisms. While it is impossible to sanitize hands, most transitory organisms may be eliminated with a thorough 30-second scrub using soap and water.

OBJECTIVE

- Herbal Hand washing is a simple act that saves lives From many life- threatening diseases.
- It prevents us from diseases like diarrhoea and influenza..
- It also prevents from communicable diseases and bacterial infections
- It is very helpful in preventing people from a weakened immune system from getting infected.
- It keeps the children stay out of diseases and concentrate on their studies.
- It saves a lot of money and resources spent on health concerns.

3.1 LITERATURE REVIEW

The herbal hand wash is formulated using neem extract for antibacterial property, aloe vera juice for soothing property,
Glycerine for Moisturiser, sodium lauryl sulphate as a surfactant,
Numerous pharmaceutical products employ reetha, eucalyptus oil as a flavoring agent, antibacterial, and stimulant, and tulsi as an antiviral, antifungal, and aromatic agent.

Leaves of Tulsi and Neem were collected

⬇

All are washed and Dried properly

⬇

Dried leaves are triturated in mortar and pestle.

⬇

After that they are used for extraction process

⬇

Formulation of Herbal hand wash

⬇

Evaluation of Herbal hand wash

4.0 MATERIAL

4.1 *Materials used in hand wash*

4.1.1 **Tulsi**

Fig.1: Tulsi

4.1.1.1 *Bionomical name :*

The fresh and drained leaves of the Lamiaceae family plant, Ocimum sanctum, are used to make tulsi. Tulsi is renowned for its antibacterial, cleansing, and detoxifying qualities. Today, tulsi is grown for its volatile oil on a commercial basis. Every component of the tulsi plant, particularly the fresh and dried leaves, is utilized in medicine. The leaves are rectangular and sharp, with minute glands scattered along the whole sterolate edges that are pubescent on both sides. The green, fragrant leaves have a little compression. Seeds are reddish black and subglobose

4.1.1.2 *Chemical constituents:*

It contains approximately 70% Eugenia, carvacrol 3% and Eugene methyl ether.It also contains caryophyllin, seeds contain fixed oil with good drying properties. The plant also contains alkaloids, glycosides, saponine, tannins an appreciable amount of vitamin c and traces of maleic and Tartaric acids.

4.1.1.3 *Uses of Tulsi :*

The leaves are used as stimulants, aromatic, spasmolytic, diaphoretic The juice is used as an antiperiodic and act as constituents of several preparation for skin disease and also to cure earache. It has antifungal and antiviral properties and boosts immunity naturally.

4.1.2 NEEM

Fig.2 : Neem

4.1.2.1 *Biological Source:*

Nearly every element of the plant that is employed as an Azadirachta indica medicine is found in neem.It belongs to the family Meliaceae. Other names for it include Indian lilac, margosa, and Azadirachta indica.

4.1.2.2. The appearance of Neem trees are medium-sized, reaching an elevation of 15 to 30 meters, and have a broad, curved top that can have a circumference of 10 to 20 meters. It sometimes loses its leaves during the dry season, although being mostly evergreen (Orwa et al., 2009; Puri, 1999). Neem is a herb with a deep taproot that is dependent on mycorrhizal fungi. Neem leaves have an elongate to rectangular shape and range in size from 20 to 40 centimetres.

4.1.2.2 Component chemical:

Because different portions of the plant contain different types of chemicals, different parts of the plant are employed for distinct commercial and medicinal reasons. Among them are: Leaf: nimbosterol, nimbin, and quercetin

Flower: kaempferol and nimbosterol Nimbosterol, Barknimbin, and Nimbidin Seeds: vepinin, nimbin, azadirachtin, and azadiradione

4.1.2.2 *Uses:*

- Handles Infection by Fungi The antifungal properties of neem have been clinically demonstrated to help cure fungal diseases. Practical for Detoxification Both external and internal cleansing may benefit from neem.
- Eating neem leaves or powder increases metabolism and helps the body rid itself of impurities by stimulating the kidneys and liver. To avoid rashes and skin conditions, you may use neem washes or paste externally to cleanse your skin of bacteria, grime, and other impurities.
- Mosquito and Insect Defender: You may repel the mosquitoes by burning a few neem leaves
- Neem is the greatest home remedy for malaria among all those used to cure the disease's early symptoms.
- Neem is a top-notch exfoliator for skin. It assists in clearing the skin's surface of dead cells, which helps stop imperfections from developing.

4.1.3 ALOE VERA

Fig.3: Aloe vera

4.1.3.1 *Biological Source*

The succulent plant species known as aloevera most likely originates over northern Africa. Despite closely related aloe not being found in northern Africa, the species has no natural populations. Since the early first century, the species has been employed in herbal therapy, according to several sources. Aloe vera extract is utilized extensively in the alternative medicine and cosmetics sectors and is promoted as having a variety of renewing, healing, and smoothing qualities.

4.1.3.2 Chemical Constituents

The three main chemical components of so-called crystalline aloevera are aloins, barbaloins, and isobarbaloins. Amorphous aloin, resin, eroding, and aloe emodin are other ingredients that are found in the medicine in amounts ranging from 10 to 30%.

4.1.3.3 *Uses*

- Aids in bringing back the natural attractiveness of skin.It supplies the cells with oxygen, strengthening the skin's tissues and promoting skin health.
- Aloevera oil extracts contain antibacterial and antifungal properties that may aid in the treatment of small skin infections; they are also helpful for dry skin when the goal is to achieve normal, smooth, and glossy skin.
- It helps to heal blisters, burns, inflammation, wounds, psoriasis, bug bites, and allergic reactions.

4.1.4 REETHA

Fig.4 : Reetha

4.1.4.1 *Biological Source:*

Acacia concinnais climbing shrub belonging to Minmosaceae.

4.1.4.2 *Morphological Features*

This deciduous tree has a 25-meter potential height. The leaves of Reetha feature long stalks and strange pinnate shapes. There are five to ten leaflet pairs on the leaf spine, which is between 30 and 50 cm long. Each leaflet is between 7 and 15 cm length and 2 to 5 cm wide.

It is lance-shaped and taper at the tip. The leaflets become smaller as they get closer to the rachis's tip.The tiny, greenish-white blooms are found in panicles at the tips of branches and are polygamous and mostly bisexual.

4.1.4.3 *Chemical Constituent :*

Reetha's main ingredients include mucilage, carbohydrates, and saponins. According to the World Health Organization, Reetha seed kernels are a good source of proteins and have a balanced amino acid makeup. There are also carbohydrates and fibers in addition to proteins.

4.1.4.4 *Uses :*

The value of the tree mostly comes from its fruit, which can be used for many pharmacological and cleansing purposes.

4.1.4.4.1 Cleanser/insecticide

The saponin ingredient found in soapnuts has natural cleaning qualities, making them suitable for use as a hair, skin, and clothes cleaner. These saponins may also be used as pesticides to get rid of head lice from the scalp.

4.1.4.4.2 Surfactant

A society that has grown reliant on fossil fuels has made methods of getting the most oil from current oil reservoirs a research emphasis.

4.1.5 *Eucalyptus oil*

Fresh Eucalyptus globular leaves and those of other species in the Myrtaceae family, such as Eucalyptus smith, are used to distill eucalyptus oil, an essential oil.

4.1.5.1 *Chemical constituent :*

Eucalyptus oil contains volatile oil of which 78-85% is 1-8 cineole also known as eukalyptol. The other constituents present are p-cymene, alpha pinene, small quantity of sesquiterpenes like, lemon, aldehyde, ketone and alcohols.

4.1.5.2 *Uses :*

Antispasmodic, flavoring, antibacterial, stimulant, and aromatic deodorant are some of the uses for the oil. Eucalyptus oil also used in air freshners.

4.1.6 *Orange oil*

Applications for orange oil are many and include anything from boosting mood and lowering stress levels to creating a crisp, zesty scent. Orange oil has antibacterial qualities as well.

4.1.7 Glycerin

As a humectant, glycerine draws moisture from the air and deeper layers of the skin to the skin's outermost layer.

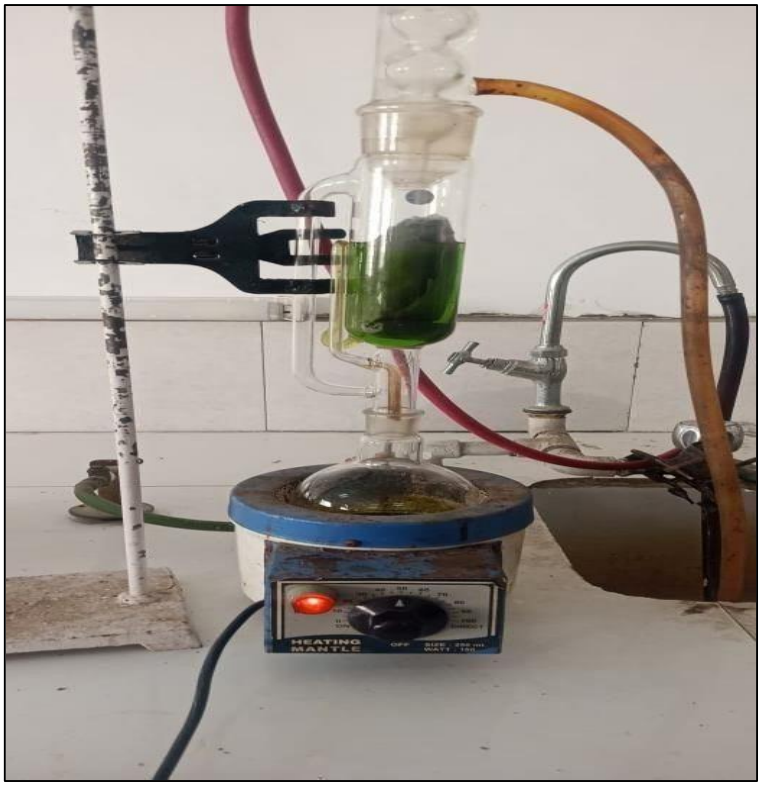
4.7.1 Methyl Paraben

Methyl paraben is a preservative. It is the methyl ester of
hydroxybenzoic acid. It is the an anti-fungal agent often used in a variety of cosmetics and personal care products.

4.1.7 Sodium lauryl sulphate - Foaming agent

4.2 Extraction Method of Tulsi

Sample of tulsi leaves were separated and washed with water and dried properly. Dried leaves were separated.



Ethanolic extract was prepared from the tulsi powder.

Fig 5-Extraction Of Tulsi

4.3 Extraction Method of Neem

- The neem leaves were collected and washed with tap water and dried at room temperature.
- Dried neem leaves were grinded into a fine powder. The plant powder was extracted in ethanol using Soxlet
- extraction unit.

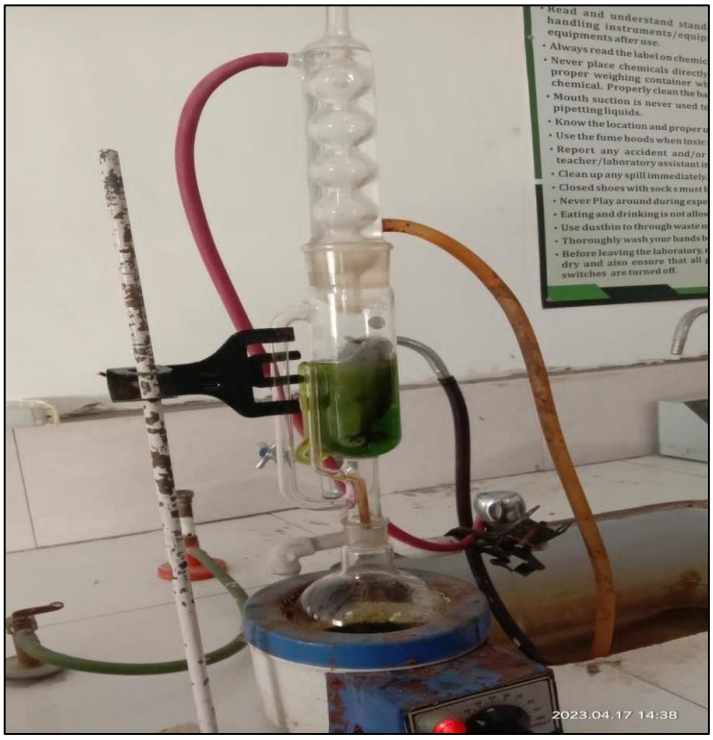


Fig 6-Extraction Of Neem

Formulation Table :

Table no.1

Ingredients	Quantity	Action
Tulsi Extract	13 ml	Antimicrobial agent
Neem Extract	10 ml	Antifungal agent
Orange oil	6.5 ml	Flavouring agent
Aloe- vera gel	10 ml	Healing agent
Reetha	11.5 gm	Foaming agent
Eucalyptus oil	1.3 ml	Cooling agent
Glycerine	20 ml	Moisturizing agent
Sodium lauryl sulphate	4 gm	Foaming agent
Methyl paraben	0.5 gm	Preservative
Water	Up to 100 ml	

Procedure

- Ethanolic extract of tulsi leaves is mixed with ethanolic extract of neem leaves.
- Then add aloe vera and add sapindus mukorosis with sodium lauryl sulphate to produce sufficient foaming capacity.
- Then add desired quantity of glycerine and eucalyptus oil with moderate stirring.
- At the end add preservative in sufficient quantity.
- The solution is mixed, made homogenous under room and further utilized for screening of the activity

5.0 FORMULATION AND EVALUATION

Organoleptic Evaluation:

Color: Greenish **Odor:** Citrousy **Texture:** Clear

5.0 ***Irritancy Test***

The preparation is free of redness, edema, inflammation, and pain during irritancy tests. Utilizing these formulations on the hand is completely safe.

5.1 ***Stability***

Stability and acceptability of organoleptic properties of formulation during the storage period indicated that they are chemically and physically stable.

5.2 ***Washability***

Formulation were applied on the hand and then ease and extent of washing with water were checked manually. These formulation was easily washable.

5.3 ***Appearance and Homogeneity :***

The herbal hand wash's clarity, clumping, and uniform ingredient dispersion were examined. Under visual inspection of the prepared formulation indicated no lumps and to have uniform color dispersion, free from any fiber and particle.

5.4 ***Grittiness :***

1 ml of gel was taken on finger tips and rubbed between two fingertips then the formulation was evaluated. The prepared formulation were found to have no grittiness.

5.5 ***Determination of pH***

The pH of 10% hand wash solution in distilled water wasdetermined at room temperature 25°C.The herbal hand wash's pH was determined to be 6 using a pH pad.

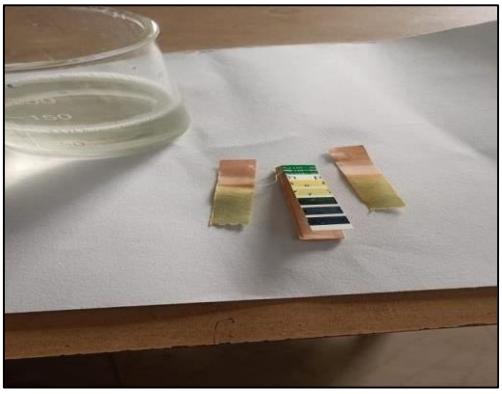


Fig-7-pH

5.6 ***Foam Retention***

50 ml of herbal hand wash taken into 250 ml graduated cylinder and shaken 10 times. The foam's volume was measured every minute; it should remain steady for at least five minutes.

5.7 ***Foaming Capacity***

Although foam formation is not directly related to the herbal hand wash's capacity to clean, it is a crucial factor for consumers and should be considered when assessing handwash. To determine the foaming ability, the cylinder shaking method was employed. The hand was placed over a 250 ml graduated container that had been filled with 50 ml of hand washing solution, and the cylinder was shaken for 10 minutes. Upon shaking for one minute, the total quantities of the foam components were noted. Only the volume of foam was computed. Immediately following shaking, the amount of foam was measured every minute for four minutes.

5.8 ***Foam Height***

1ml of sample of herbal hand wash taken and dispersed in 50 ml distilled water.
Then transferred it into 500 ml stoppers measuring cylinder, volume make up to 100ml with water. 25 stroke was given and stand still aqueous volume measured upto 100 ml and measured the foam height

Fig-08 :Foam Height

6.0 RESULT AND DISCUSSION

The natural active component in the current study demonstrated better inhibition against skin infections than the synthetic antimicrobials included in the antiseptic hand wash that is sold commercially.
Therefore, these compounds were corporated in hand wash bases in order to prepare superior antiseptic hand wash with less or no side effects.
Hence, a new way can be found to combat antibiotic resistance of pathogenic organisms and provide safe and healthier living through germfree hands, although the removal is not 100%, but a major number can be reduced with natural economic and safe herbal hand wash.

6.1 Result of Evaluation Parameter :

Table no.2

Sr. no.	Evaluation Parameter		Result
1.	Organoleptic evaluative	Color	Greenish
		Odour	Citrousy
		Texture	Clear
2.	Irritancy		No Irritation
3.	Stability		Stable
4.	Washability		Easily washable
5.	Appearance		Clear transparent
6.	Grittiness		No
7.	pH		6.5
8.	Foam Retention		Stable
9.	Foam capacity		Good foaming
10.	Foam Height		4 cm

7.0 CONCLUSION

Herbal products are more demanding in global market as they are safe with fewer side effects Hands are the primary source of diseases related to skin, respiration etc. due to various disease and germs, the bar soap get contaminated which may lead to spread of germs.
In this sophisticated world liquid hand washes are used much more frequently than the bar soap. The preliminary in-vitro study demonstrated that herbal hand wash was as effective against pathogenic bacteria.
It is an attempt made to establish the herbal hand wash containing Sacred basil extract.
From the result we can say that the herbal formulation is good in appearance, stable and acceptable.
Finally it is concluded that this herbal hand wash provide an effective and safe alternative to existing marketed hand wash.

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