



# FORMULATION AND EVALUATION OF HERBAL HANDWASH BY EXTRACTION OF NEEM ABOUT AUTHOR

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## ABSTRACT:

The hands are the primary routes of transmission of infection to patients. Hence, it brings up the use the antiseptic for hand washing purposes. Herbs are known to have antimicrobial properties thus utilization of such herbs as antimicrobial agent is a common practice now. Present study involves formulation of herbal hand Wash using extract of *Neem and Aloe vera*. The results may be attributed to the phytoconstituents present in the extracts. The formulation also evaluated for the quality parameters.

## Keywords:

Hand wash, Herbal formulation, *Neem and Aloe Vera*.

## Introduction:

Skin is one of the most important parts of the Body and very susceptible to microbial infections; This requires great protection and care. Skin protection from harmful microorganisms can be achieved by proper skin care and hand washing is an important process of skin care. Contaminations through hand is very often since hands are directly exposed to the environment and utilized mostly for the handling purpose thus appropriate hand wash with antimicrobial Agent must require to assure removal of transient microorganisms. Hand washing is also important in Homes and day to day care operations. Hand washing Is an important way to reduces spread of disease. Hand washing removes harmful material from hands Along with harmful microorganisms. Plants with medicinal properties are being used as a traditional medicine anciently. The extract from the different parts of Various

medicinal plants have been employed as a Natural remedy in curing various ailments and diseases. Recently the medicinal

plants have been explored largely as therapeutic as well as cosmetic agent *Neem belonging* to the family *Meliaceae*, is a medium sized tree. The major constituents are azadirachtin and the others are nimbolinin, nimbin, nimbidin, nimbidol, sodium nolate, gedunin, salannin, and quercetin. Therapeutically it possesses anti-microbial, anti-inflammatory and antibacterial, antiulcer, antifungal, antimalarial, antioxidant, antiviral antimutagenic, anticarcinogenic properties. Many researchers have investigated plant extract for various Purposes. The present study focuses on a novel hand wash formulation with the extract of *Neem* Having antimicrobial and antibacterial properties, which can also be used as a regular hand-wash.

The herbal medicine is also known as botanical treatment or phytomedicine. Herbal medication refers to the uses of any seeds, root, leaves, bark, flower and aerial part for medicinal purpose. Herbal medicine have been the treatment and care of numerous disease. Skin being the most exposed part of our body requires protection from skin pathogen. To defend the skin from harmful micro-organism to avoid spreading Disease. Hand washing is extremely significant precautions. Hand hygiene is the single Most important simplest and least expensive mean of preventing nosocomial Infection. Handwashing is main purpose of cleaning hands with removing Soil, dirt, pathogenic microorganisms and avoid transmitting of transient microorganisms. Hygiene is basically defined as the branch of science which is involved in knowledge and practice related to promotion of health. The concept highlights the need of maintaining hygiene in prevention of disease. Spread of infection (bacterial or viral) can be prevented hygiene practices. An herbal drug treatment give healthy life. It was general used flourish first line and common health provider. Since ancient time in India herbal medicine have been the basis of treatment and cure for various diseases. Herbal medicine having various therapeutic uses like healing, wound, treating inflammation due to infection, skin lesion, leprosy, diarrhea, scabies venereal disease like, snake bite and ulcer. Plant have provided good source of antimicrobial activity and plant extract have potential as antimicrobial compound against several pathogenic microorganisms which cause infections disease and resistance toward synthetic drug.

### Health Benefits of Hand wash: -



Fig No:1

- ✓ Hand washing with soap removes germs from hands.

- ✓ Helps prevent infections because: People frequently touch their eyes, nose, and mouth without even realizing it. Germs can get into the body through the eyes, nose and mouth and make us sick.
- ✓ Helps minimize the spread of influenza.
- ✓ Avoiding respiratory infection.
- ✓ Preventive measure for infant deaths at their home birth deliveries.
- ✓ Improved hand washing practices have been shown to lead to small improvement in the length growth in children under five years of age.
- ✓ Prevention of diarrhoea and uncomfortable intestinal diseases.
- ✓ Creating a safer working environment for medical staff and the patients.

#### **Advantages of hand wash: -**

1. No side effects.
2. Bacteria on our hands can be minimized.
3. It also helps to clear antiseptic and fungal problems faced by the skin.
4. It also helps to remove dirt and oil effectively from the skin.
5. Easier access compared to using soap and water.
6. The easiest way to get rid of microorganisms.
7. Hand wash prevents germs from entering our body and takes less time to use.
8. Can be made more accessible than sinks.
9. Causes less skin irritation and dryness.
10. Are more effective in reducing the number of bacteria on hands.
11. Has led to improved hand hygiene practice.

**Raw Material:**



**Fig : 1  
to 6**



## 1) Aloe vera:-



**Fig No:7** ✓ Scientific classification of

aloe-vera:-

- ✓ **Kingdom** : plantae
- ✓ **Order** : Aspargels
- ✓ **Family** : Xanthorrhoeaceae
- ✓ **Genus** : Aloe
- ✓ **Species** : A.Vera
- ✓ **Bionomical name** : Aloe Vera

Aloevera is a succulent plant Species that probably originated in northern Africa. The Species does not have any naturally occurring population, although closely related Aloe Does not occur in northern Africa. The Species is frequently cited as being used in herbal Medicine since the beginning of the first century. Extract from the Aloe Vera widely used In cosmetic and alternative medicine industries, being marketed as variously having Regenerating, healing, or smoothing properties.

Aloe is the dried juice collected by incision from the basis of the leaves of various Species of aloe. Aloe Perry Baker, aloevera Linn, or Aloe barbandesis belonging to family Liliaceae, Aloe Perry Baker is found in Socotra and zanzibar Islands and in their Neighbouring areas and so the obtain from these Species is known as soothing and Zanzibar. Aloevera Linn also known as vulgaris or Aloe barbandesis. Aloe is an perennial Growing to 0.8 by 1ml ate slow rate. The plant prefers light (sandy) and medium soil. Can Grow nutritionally poor soil. The plant prefer acid basic and neutral soil. It cannot grow in Shade it requires dry or moist soil and can tolerate drought. They are xenophobic plant .it Can be propagated by seeds. Seeds are shown in the spring in warm green house.

**Chemical constituents:-**

The most important constituents of aloe vera are three isomers of Aloins, Barbaloin and isobarbaloin which constitute so called crystalline along present in drug at from 10-30% other constituents are amorphous aloin, resin, eroding and Aloe Emodin.

Barbaloin is present in all the varieties. It is slightly yellow color, bitter water soluble Isobarbaloin is a crystalline substance present in curaco Aloe and in trace amounts in cape Aloe and in absent in socotrine and zanzibar Aloe. The chief constituents of socotrine Aloe and Zanzibar Aloe is Barbaloin.

**Aloe Vera has been recommended for skin care in number of ways: -**

- Relieves the burned skin caused by skin.
- Smooth and glowing skin can be achieved with the help of Aloe.
- It is an outstanding skin moisturizer.
- Helps in restoring skin natural beauty. It provides oxygen to the cells which strengthen the skin tissues and help to keep the skin healthy.
- It is beneficial for dry skin when the aim is to get normal, smooth and shiny skin with the oil extract of the plant.
- Aloe vera extracts have antibacterial and antifungal activities, which may help in the treatment of minor skin infections.
- It is helpful in curing blisters, insect bites and any allergic reactions, eczema, burns, inflammation, wounds, psoriasis. A large number of aloe vera based cosmetics products are available commercially that claim for natural skin care based.

**2) Neem: -****Fig No:8**

- ✓ **Scientific classification of Neem:-**
- ✓ **Kingdom:** - Plantae
- ✓ **Order:** - saphinadales
- ✓ **Family:** -Meliaceae
- ✓ **Genius:** -Azadirachta
- ✓ **Species:** -A.Indica
- ✓ **Bionomical name:** - Azadirachta Indica

Products made from neem trees have been used in the traditional medicine of India for centuries, but there is insufficient clinical evidence to indicate any benefits of using neem for medicinal purposes.] In adults, no specific doses have been established, and short-term use of neem appears to be safe, while long term use may harm the kidneys or liver; in small children, neem oil is toxic and can lead to death. Neem may also cause miscarriages, infertility, and low blood sugar. Neem is a key ingredient in non-pesticidal management (NPM), providing a natural alternative to synthetic pesticides. Neem seeds are ground into powder that is soaked overnight in water and sprayed on the crop. To be effective, it must be applied repeatedly, at least every ten days.

Neem does not directly kill insects. It acts as an anti-feedant, repellent, and egg-laying deterrent and thus protects the crop from damage. The insects starve and die within a few days. Neem also suppresses the subsequent hatching of their eggs. Neem-based fertilizers have been effective against southern armyworm. Neem cake may be used as a fertilizer citation needed. Neem oil has been shown to avert termite attack as an ecofriendly and economical agent.

Azadirachta is a genus of two species of trees in the family Meliaceae. Numerous species have been proposed for the genus but only two are currently recognized, Azadirachta excelsa and the economically important tree Azadirachta Indica, the Neem tree, from which neem oil is extracted. Both species are native to the Indomalaysian region, and A. Indica is also widely cultivated and naturalized outside its native range.

#### **Chemical constituents:-**

The chemical constituents are found in the leaves of name as nimbin, nimbanene, 6desacetylnimbinene, nimbandiol, nimbolide, ascorbic acid, nhexacosanol and amino acid, 7desacetyl-7-benzoylazadiradione, 7 desacetyl-7-benzoylgedunin, 17-hydroxyazadiradione and nimbiol.

#### **Neem has been recommended for skin care:**

- 1)Treating acne and hyperpigmentation 2)Healing burns and abrasions
- 3) Moisturizing the skin
- 4)Relieving dandruff
- 5)Stimulating hair growth

6)Repairing the skin and hair from environmental damage 7)Treating head lice

8) Treating fungal infections

9) Acts as an antibacterial clearing up skin irritations and acne.

10) Anticarcinogenic activity

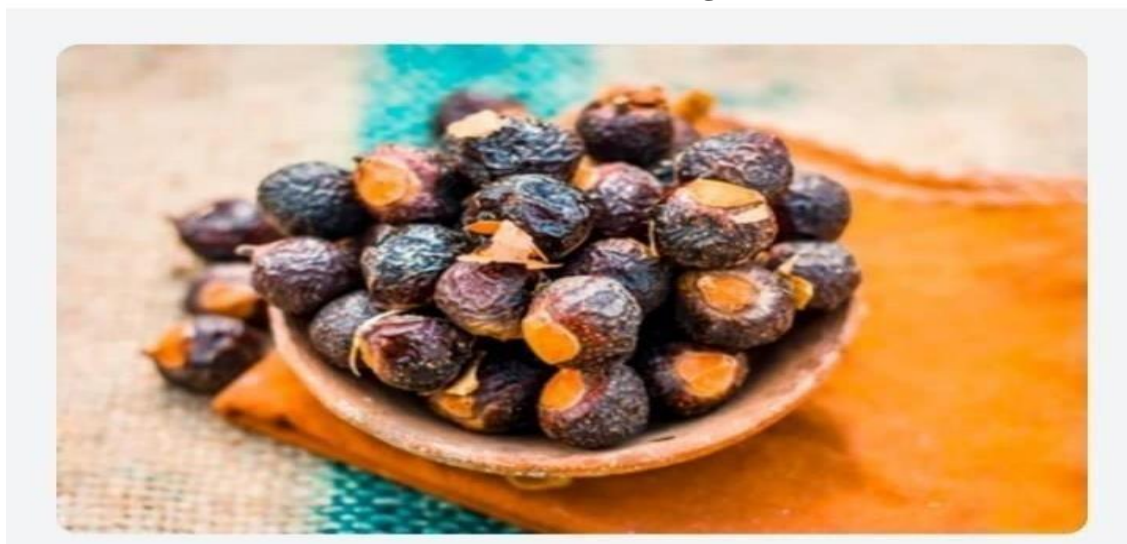
11) Antibacterial activity

12)Anti candidial activity

13) Anti plaque activity

### 3) Ritha: -

Fig No:9



✓ **Scientific classification of ritha: -**

✓ **Kingdom:**-Plantae

✓ **Order:** -Sapindales

✓ **Family:** -Saphinadales

✓ **Genus:** -Sapindas

✓ **Species:** -S. Mukorossi

✓ **Bionomical name:** - Sapindas Mukorossi

Ritha, scientifically known as *Sapindus Mukorossi*, is a large deciduous tree of the Saphinadales family. It is commonly known by many names like soapberry, soapnut, washnut, ritha, dodan, and dodani. In countries like Japan and China, Ritha has been used for centuries. In Japan, it has been used as a life- prolonging pericarp (the part of a fruit enclosing the seeds) and in China as a fruit for managing illnesses. The plant is well known for its folk medicinal values.



Ritha is found in the hilly regions of the Himalayas in India. The fruit of Ritha has been used in Indian Ayurvedic medicine for decades. Ritha is a popular ingredient of many Ayurvedic shampoos and cleansers.

The spermicidal (sperm killing) activity of the saponins present in Ritha makes it beneficial as a contraceptive. The human spermatozoa (sperm cells) show morphological (structural) changes when exposed to saponins. These morphological changes cause the sperm cells to disrupt. It has been used in a contraceptive cream due to its spermicidal activity.

According to a lab study, the extract of Ritha could stop the growth of *Candida albicans*, which causes cutaneous (skin) candidiasis infection. Extract of Ritha showed strong anti-fungal activity against *Candida parapsilosis*. The saponin portion of the extract showed activity against the fungus *Trichophyton rubrum*.<sup>1</sup>

### **Chemical constituents of Ritha:-**

Seeds of *Sapindus Mukorossi* contain 23 % oil of which 92 % is triglycerides; the triglyceride fraction contained 30 % oleo-palmito-arachidin glyceride, 13.3 % oleodiarachidin glyceride and 56.7 % di-olein type glycerides such as dioleo-palmitin, dioleostearin and dioleo-arachidin 6.

### **Ritha has been recommended for skin care:-**

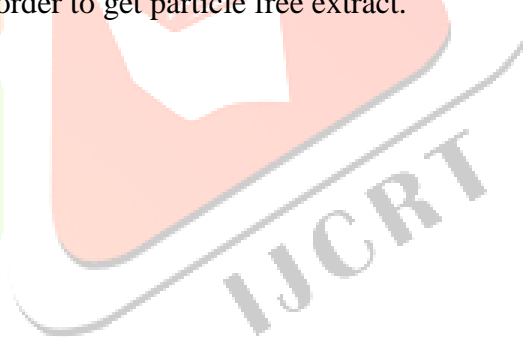
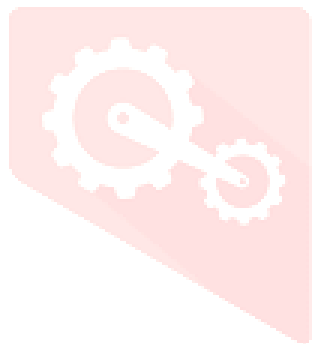
- 1) Anti inflammatory activity
- 2) Cytotoxic activity
- 3) Molluscicidal activity
- 4) Anti-platelet aggregation activity
- 5) Anti diabetic activity
- 6) Anti hyperalgesic activity.

**Table No: -1. Material and their Uses: -**

<i>Sr.no</i>	<i>Material</i>	<i>Uses</i>
1.	Aloevera	Crude drug
2.	Neem	Crude drug
3.	Ritha	Natural foaming agent
4.	Methyl paraben	Preservatives
5.	Sodium lauryl sulphate	Foaming agent
6.	Glycerine	Moisturizing agent
7.	Orange oil	Perfume

**Extraction of *Azadirachta Indica* (Neem): -****Fig No: 10**

The leaves of *Azadirachta Indica* (Neem) were collected, dried and grinded into powder and stored for further study. Other ingredients used were of analytical grade. The hand wash was prepared from the methnolic extracts of plant material 5 g of the powdered material were extracted with 50 ml of methanol solution (9 Parts of methanol and 1 part of distilled water) by means of extraction. This mixture was heated on water bath for 1 hour. The content was filtered through Whatman filter paper in order to get particle free extract.



**Extraction of Aloe vera: -****Fig No:11**

The leaves of Aloe Vera were collected, dried and grinded into powder and stored for further study. Other ingredients used were of analytical grade. The hand wash was prepared from the methanolic extracts of plant material 5 g of the powdered material were extracted with 50 ml of methanol solution (9 Parts of methanol and 1 part of distilled water) by means of extraction. This mixture was heated on water bath for 1 hour. The content was filtered filter paper in order to get particle free extract.

**Extraction of Ritha :-****Fig No:12**

*Ritha* were collected, dried and grinded into powder and stored for further study. Other ingredients used were of analytical grade. The hand wash was prepared from the methanolic extracts of plant material 5 g of the powdered material were extracted with 50 ml of methanol solution (9 Parts of methanol and 1 part of distilled water) by Means of extraction. This mixture was heated on water bath for 1 hour. The content was filtered through Whatman filter paper in order to get particle free extract.

**Formulation Table:-****Table No 2: -**

<b>Sr no</b>	<b>Ingredients</b>	<b>Quantity</b>
1.	Neem	5gm
2.	Aloe Vera	5gm
3.	Sodium lauryl sulphate	2gm
4.	Ritha	5gm
5.	Methyl paraben	0.2gm
6.	Glycerine	2ml
7.	Gum Tragacanth	2gm
8.	Orange oil	q.s
9	Water	q.s

**Procedure: -**

1. The hand wash was prepared by adding methanolic extracts all plant material in glycerin and distilled Water.
2. Finally, sodium lauryl sulphate, methyl paraben, coloring and flavoring agents were added as Per the requirement of standard procedure for preparation of hand wash.
3. The solution was made homogenous using homogenizer under room temperature and stored for the further analysis.

**Evaluation parameters: -**

Physical evaluation of the Herbal Hand wash was Visually carried out. The sensory characters such as Texture, Color and fragrance were determined.

**1. Physical evaluation: - ✓ Appearance: -**

It was determined visually.

**✓ PH: -**

The PH was determined using digital PH meter and the **PH of herbal handwash was found to be 6.2.**

**✓ Color: -**

It was determined visually.

**✓ Odor:-**

It was determined manually.

**✓ Stability studies:-**

The stability of herbal hand wash gel was carried out by storing measured amount of gel at different temperature i.e., 25°C, 37°C, 40°C for one week during stability studies no change in color and no phase separation were observed in the formulated hand wash.

**✓ Foam height: -**

- 1) 1ml of sample of herbal hand wash was taken and dispersed in 50 ml distilled water.
- 2) Then transfer into 500ml stoppers measuring cylinder volume make-up to 100 ml with water
- 3) 25 stroke was given and stand till aq. volume measured unto 100ml and measured the foam height.

✓ *Foam Retention:* -

50ml herbal hand wash was taken into 250ml graduated cylinder and shaken 10 times. The volume of foam at 1min. Interval for 1 min was recorded foam retention should be stable at least 5 min.

✓ *Skin Irritation:* -

The herbal hand wash was tested for skin irritability by applying on hand and washed off with water.

Table No:-3

**Result of evaluation parameters:**

Sr.no	Evaluation parameters	Observed Results
1.	PH	6.2
2.	Colour	Green
3.	Odour	Pleasant
4.	Stability	Stable
5.	Foam height	3.4 cm
6.	Foam retention	Stable
7.	Skin irritation	No irritation

**Conclusion:-**

Hands are the primary source of disease related to skin, respiration, gastrointestinal Tract 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 then the bar soap ,the additional Advantages is the soap in the liquid hand wash Is untouched leading uncontaminated. Hand wash with every new pump. In market, there are Various type of hand washes are available, claiming that they kill the harmful germs at Considerable rate at minimum time. To determine this, it is necessary to determine the Efficiency of handwash average percentage reduction and log reduction of the organisms Determined for hand wash performing viable count.



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