

A Review on Formulation and Evaluation of Herbal Handwash.

Mr. Chaitanya D. Jadhav*, Ganesh S. Patel, Shital I. Rathod, Saurabh R. Bhavsar. Guided By :- Mr. Vinit S. Khairnar (Assistant Professor AIOP).

Department of Pharmacognosy, Ahinsa Institute Of Pharmacy, Dondaicha, Shindkheda, Dhule, India 425408.

Submitted: 15-05-2023

Accepted: 30-05-2023

ABSTRACT:

The development of a herbal hand wash with a liquid base was done primarily to encourage "personal hygiene." One of the most important steps in the preparation of food, food service, housekeeping, and other daycares facilities is hand hygiene. Current market. Alcohol-based cleaning supplies, which are used in antibacterial hand washing, have a variety of drawbacks. To prevent the negative effects of synthetic hand wash preparations, such as itching, dryness, irritation, and dermatitis, and to avoid allergic reactions and any other adverse effects, consumers constantly look for cosmetics made from natural ingredients. It would be helpful to conduct more research before creating a hand wash with extra skin benefits. A liquid-based herbal hand wash was developed using extracts from *Ocimum Sanctum* Leaves & *Moringa Oleifera* Leaves. After formulation, it was evaluated and various parameters such as physical and chemical properties such as pH, colour, odour, appearance, Texture, Spreadability, Grittiness, Skin irritancy, Foam height, Foam retention, Cleaning action, Stability, and other parameters were used to evaluate herbal hand wash, and the result was found to be within normal range with minimum or no side effects.

KEYWORDS: Herbal hand wash, Herbal extract, *Ocimum Sanctum*, *Moringa Oleifera*, Hygiene, Cleaning, Foam.

I. INTRODUCTION :-

The herbal medicine is also known as phytomedicine or botanical treatment. The use of any plant's seeds, roots, leaves, bark, flowers, or aerial parts for medicinal purposes is known as herbal medicine. Since the skin is the most exposed part of the body, it needs to be protected from skin pathogens. Herbal medicine has been used to treat and care for many diseases.(1)This herbal hand wash contains many natural herbs that are very effective against certain microorganisms. Herbal hand soap is beneficial for both economic and

medical purposes. Microbes enter our bodies through our hands, which are the primary source. Using hand soap to wash your hands can stop some bacteria from getting in. Protecting one's hands is just as important as stopping bacteria from getting in.(2)Hand Washing removes visible dirt from hands and reduces the number of harmful microorganisms such as *E. coli* and *S aureus* can be carried by people, food, animal or equipment & transmitted. To protect the skin from harmful microorganism and to avoid spreading of numerous contagious diseases, hand washing is extremely important. Books on Ayurvedic medicine, written in the Vedic period (3500–1600 B.C.) describe practices, including the use of medicinal plants. In modern complementary and alternative medical practice, plants are the primary source of therapeutics because bioactive components present in each part of the plant, including the seeds, root, stem, leaves, and fruit. The benefits associated with the use of medicinal plants are like they are cost-effectiveness and global availability. They are safe as compared to synthetic compounds. They are natural products so they are side effect free which is most important advantage of medicinal plants.(3)Skin is first protection line of human body it covered the inner part of body and protect them from the pathogens. So protect the skin from harmful microbes and to prevent spreading of many contagious diseases hand washing is important precaution. Hands are primary mode of transmission of microbes and infections. Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs and prevent the health care associated infection.

Hand hygiene is the simplest, and least expensive measure to prevent infection. Now a day corona virus pandemic condition (COVID-19) hand washing getting a lot of importance. Prevention is better than cure. Hand washing is the act of cleaning hands with the purpose of removing soil, dirt, pathogenic microorganisms and avoid transmitting of transient microorganism.(4)Numerous chemical antiseptics, such

as alcohol-based sanitizers and chlorhexidine products, are now available on the market. These soaps or solutions help prevent contagious disease transmission in healthcare settings more effectively, but they have some drawbacks or side effects. They can irritate the skin and make pathogens resistant if used frequently.(5)

1. ADVANTAGES AND DISADVANTAGES OF HERBAL HANDWASH :-

Advantages of Herbal Hand wash :-

- 1) No side effects.
- 2) Bacteria on our hands can be minimized.
- 3) It also helps to clear antiseptic and fungal problem 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 microorganism.
- 7) Hand wash prevent germs from entering into our body.(6)

Disadvantages of herbal handwash :-

1. chronic skin damage.
2. irritant contact dermatitis and eczema.

3. Benefits of Herbal Hand Wash :-

- Ease of availability.
- Cheap Cost of herbal plants is less as compared to chemically used in synthetic hand washes.
- Increased efficiency.
- Herbal hand washes are more efficient in promoting hand hygiene.
- Less side effects.
- Herbal hand washes have fewer side effects than other hand washes.(7)

4. MATERIALS USED IN HERBAL HAND WASH :-

- 1) Tulsi
- 2) Drumstick Leaves
- 3) Lemon water
- 4) Rose water
- 5) Sodium Lauryl Sulphate
- 6) Glycerine
- 7) Propyl Paraben
- 8) Distilled Water.

Ocimum Sanctum (Tulsi):



Fig 3: Tulsi

Synonyms: Sacred basil, Holy basil.

Biological Source: Tulsi consists of fresh and dried leaves of *Ocimum sanctum* Linn. Belonging to family Labiateae.

Geographical Source: It is a herbaceous, much branched annual plant found throughout India, it is considered as sacred by Hindus. The plant is commonly cultivated in garden and also grown near temples. It is propagated by seeds. Tulsi, nowadays, is cultivated commercially for its volatile oil.(8)

SCIENTIFIC CLASSIFICATION :-

Kingdom: Plantae (unranked) **Angiosperms (unranked) Eudicots (unranked) Asterids**
Order: Lamiales
Family: Lamiaceae

Genus: *Ocimum*

Species: *O. tenuiflorum* & **Binomial name:** *Ocimum tenuiflorum* or *Ocimum sanctum* L.(9)

OCIMUM SANCTUM L. (TULSI): A PLANT FROM GENUS OCIMUM SANCTUM.

Among the plants known for medicinal value, the plants of genus *Ocimum* belonging to family Labiate are very important for their therapeutic potentials. *Ocimum sanctum* L (Tulsi), *O. gratissimum* (Ram Tulsi), *O. canum* (Dulal Tulsi), *O. basilicum* (Ban Tulsi), *O. kilimandschicum*, *O. americanum*, *O. camphora* and *O. micranthum* are examples of known

important species of genus *Ocimum* that grow in different parts of the world and are known to have medicinal properties.

Therapeutic uses of *Ocimum sanctum* Linn (Tulsi) :-

As expectorant, analgesic, anticancer, antiasthmatic, antiemetic diaphoretic, antidiabetic, antifertility, hepatoprotective, hypotensive, hypolipidmic and antistress agents. Tulsi has also been used in treatment of fever, bronchitis, arthritis, convulsions etc.

Tulsi is referred to as *Ocimum sanctum* or holy basil and it is found in 150 different varieties worldwide. Tulsi is queen of all herbs. It is widely used in herbal hand wash formulation and also. Used in Ayurvedic and Naturopathic medicines. Tulsi helps in the healing of the human body in a natural manner. Tulsi is well known for its varied properties- like anti-bacterial, anti-fungal, anti-pyretic, anti-oxidant, and anticancer. It acts as air purifier which can absorb many toxic chemicals like xylene, formaldehyde and benzene. According to vastushastra, the holy basil or green tulsi is the mostly widely accessible tulsi plant is considered favourable. Tulsi is bushy plant located in tropical and semi tropical regions of the world. It has a unique fragrance and a distinct taste. It grows up to height of 3- 5feet. Tulsi is widely used as a herbal tea, in ayurveda and has a place within the Vaishnava tradition of Hinduism, in which devotees perform worship of tulsi plant. Tulsi is found in three assortments: ramatulsi having green leaves, krishnatulsi having purple leaves and vanatulsi is a wild tulsi.(10)

Chemical constituent :-

There are many chemical constituent are present in *ocimum sanctum* such as fatty acids 4.71 %, fatty alcohols 26.70%, organic acids and ketones, enone, aldehyde, ester organic nitro alcohols, dialkyl disulphides 21.91%, Monoterpenoids, Diterpenoids, Sesquiterpenoids, Triterpenoids, Phenylpropanoids, Flavonoids Alloxazines and isoalloxazines.(11)

Uses:

- 1) It is also a good anti-oxidant.
- 2) It acts as blood purifier.
- 3) It helps in indigestion and gastric disorders.
- 4) It helps in reduce stress
- 5) It protects from heart diseases
- 6) Beneficial in treating asthma
- 7) Used as anti-ulcer property

- 8) Tulsi leaves is used for relief from cough and cold.
- 9) It has nematicidal activity against *tylenchulus semipenetrans*, *anguinatritici*.
- 10) Leaf extract is effective to treat skin disorders.(12)

Moringa Oleifera:



Fig 2: Moringa Oleifera

Moringa Oleifera:

Moringa (moringa oleifera Lam) is type of local medicinal Indian herb which has turned out to be familiar in the tropical and subtropical countries. [4] *Moringa oleifera* is one of the vegetables of the Brassica order and belongs to the family Moringaceae.

It was recently discovered that the *Moringa Oleifera* seed extract exhibited antifibrotic effects on liver fibrosis in rats (Hamza, 2010). It shows significant protective effect against CC14 – induced liver fibrosis in rats which was confirmed by histological findings as well as biochemical analysis of a marker of collagen deposition in liver known as hydroxyproline.

Treatment with *Moringa* was found to stimulate the parietal cells to give effect against hepatocellular injury by blocking the increase of two serum, aspartate aminotransferase (AST) and alanine aminotransferase (ALT) which are indicators of liver health conditions. (13)

Plant Profile:- Kingdom: Plantae **Class:** Tracheophytes **Order :** Brassicales **Family:** Moringaceae **Genus:** *Moringa*
Species : *M. oleifera*.(14)

CHEMISTRY :- One of the earliest and most extensive studies on the chemical constituents of an ethanol extract of *M. oleifera* leaves was conducted

by Saleem (1995). The study was published only as a thesis and never in a peer-reviewed journal. The author isolated and provided structure elucidation of 23 compounds using a variety of separation and spectroscopic techniques such as infrared and ultraviolet spectroscopy, mass spectroscopy, gas chromatography, gas chromatography–mass spectroscopy, and nuclear magnetic resonance spectroscopy. In addition to the rhamnosyloxy benzyl isothiocyanate niiaziminins, niiazinins, and niacininins, various methylated, ethylated, and acetylated rhamnosyloxy benzyl carbamates and rhamnosyloxy benzyl thiocarbamates were isolated and characterized. An additional 63 compounds were identified in an ethanol extract of *M. oleifera* pods. As noted earlier, Faizi et al. (1998) used bioassay (15)

Medicinal Uses :-

- Antilithic,
- carminative,
- Antifertility,,
- anti-inflammatory,
- stimulant in paralytic afflictions; act as a cardiac/circulatory tonic,
- used as a laxative. (16)

LEMON :



Fig 3: Lemon

Scientific Classification of Citrus lemon:

Kingdom : Plantae **Family** : Rutaceae **Order** : Sapindales **Genus** : Citrus **Species** : c.lemon

Lemon was introduced into Spain and North Africa sometime between the years 1000 and 1200 CE. It was further distributed through Europe by the Crusaders, who found it growing in Palestine. In 1494 the fruit was being cultivated in the Azores and shipped largely to England. The lemon was thought by 18th- century Swedish botanist Carolus

Linnaeus to be a variety of citron (*Citrus medica*), though it is now known to be a separate hybrid species.

Ceviche. Peruvian ceviche (sebiche). Raw seafood dish with lime, cilantro, peppers, plantains. Cuisine, food Britannica Quiz A World of Food Quiz The lemon plant forms an evergreen spreading bush or small tree, 3–6 metres (10–20 feet) high if not pruned. Its young oval leaves have a decidedly reddish tint; later they turn green. In some varieties the young branches of the lemon are angular; some have sharp thorns at the axils of the leaves. The flowers have a sweet odour and are solitary or borne in small clusters in the axils of the leaves. Reddish-tinted in the bud, the petals are usually white above and reddish purple below. The fruit is oval with a broad, low, apical nipple and forms 8 to 10 segments. The outer rind, or peel, yellow when ripe and rather thick in some varieties, is prominently dotted with oil glands. The white spongy inner part of the peel, called the mesocarp or albedo, is nearly tasteless and is the chief source of commercial grades of pectin. The seeds are small, ovoid, and pointed; occasionally fruits are seedless. The pulp is decidedly acidic.

As a cultivated tree, the lemon is now grown to a limited extent in most tropical and subtropical countries. Lemon trees for commercial planting are usually propagated by grafting or budding the desired variety on seedlings of other Citrus species, such as the sweet orange, grapefruit, mandarin orange, sour orange, or tangelo. Seedlings of these species are superior to lemon seedlings as rootstocks because they are more uniform and less susceptible to the various crown- and foot-rot diseases.

The relatively cool, equable climatic zones of coastal Italy and California are especially favourable for lemon cultivation. The trees are commonly grown in orchards, where they are spaced 5–8 metres (16–26 feet) apart. Lemon trees usually bloom throughout the year, and the fruit is picked 6 to 10 times a year. Full-sized fruit for commercial purposes is about 50 mm (2 inches) in diameter. The fruit is usually picked while still green and, after curing, may be kept three months or more in storage.

Young lemon trees reach bearing age as early as the third year after planting, and commercial crops may be expected during the fifth year. The average orchard yield per tree is 1,500 lemons a year. Careful handling is essential to prevent the loss of fruit in storage and transit because of fungal diseases. Picked lemons are

graded in the packing house according to their maturity, which is indicated by their colour yellow fruits are already fully ripe and must be sold immediately, while fruits that are still green are held in storage until they become a uniform yellow in colour.(17)

CHEMICAL CONSTITUENTS :Lemon balm (*Melissa officinalis* L.) is a popular herb used as an aromatic and medicinal resource as well as a herbal tea. Due to a lack of information on the hydroponic growth of lemon balm, three hydroponic systems (artificial soil bed, perlite bed, and aeroponic) that could be applied to industrial production were tested in the present study. In this context, the growth parameters, mineral contents, color traits, anti-oxidative capacities, and phenolic compounds of lemon balm were analyzed.

In addition, they showed lowered total phenolic acid content and radical scavenging capacity, which was associated with decreased rosmarinic acid and lithospermic acid A, the major phenolic compounds in lemon balm.(18).

MEDICINAL USES :

The efficiency of lemon washes off all the impurities including dirt, oil and pollutants. Lemon is known for its antimicrobial and anti-bacterial properties which give a tough defeat to harmful germs and bacteria. It enhances the skins’ health and makes the hands soft and shiny.

ROSE WATER :



Fig 4: ROSE WATER

- **Kingdom** – Plantae
- **Division** – Magnoliophyta

- **Class** – Magnoliopsida
- **Order** – Rosales
- **Family** – Rosaceae
- **Genus** - Rosa
- **Species** – Centifoli. (19)

Medicinal uses of Rose water : It may be used effectively to reduce anxiety, stress, depression and pain. It has healing property , Moisturizes the skin. ,It improves skin tone and brightenss , It helps to reduce blemishes, acne scars and dark spot.(20)

Table 1: Formulation and evaluation of herbal hand wash by using natural ingredients.

Ingredients	Quantity	Actions
Extract of Ocimum Sanctum and Moringa Oleifera	of 20ml	Antibacterial agent
Lemon Water	20ml	Antiseptic agent
SLS	6 ml	Foaming agent
Glycerine	40 ml	Moisturizing agent
Propyl Paraben	0.3 gm	Preservative
Rose water	5ml	Perfuming agent
Distilled water	Up to 100 ml	

II. MATERIALS & METHODS:

1. Collection of plant materials: The plants *Ocimum sanctum* L and *Moringa oleifera* were collected from the garden area of Ahinsa institute of pharmacy, dondaicha.
2. Preparation *Ocimum sanctum* herbal leaf extracts: The collected plant *ocimum sanctum* L. A leaves are taken and coarsely powdered. 10 grams of coarsely powdered leaves of plant were soaked in 90 ml of methanol (9:1). And kept for maceration for about 3-4 days. After maceration the extract is filtered and the filtrate was collected and used for making hand wash.
3. Preparation of *Moringa oleifera* herbal leaf extracts: The collected plants *Moringa oleifera*

and *Moringa oleifera* A leaves are taken and coarsely powdered. 10 grams of coarsely powdered

4. Leaves of plant were soaked in 90 ml of methanol (9:1). And kept for maceration for about 3-4 days. After maceration the extract is filtered and the filtrate was collected days.
5. Preparations of herbal hand wash formulations:: This formulation was prepared by adding 20 ml of lemon juice to 20 ml of methonolic extract filtrate of *Ocimum sanctum* L and *Moringa oleifera*A leaves. To this filtrate 6g of SLS, glycerine 40 ml, 0.3 g of propyl paraben, 5ml of rose water is added and the volume is made up to 100ml with purified water.

6. Evaluation test for herbal hand wash :-

1) Foam Height :-

One gram of sample of hand wash gel was taken and dispersed in 50ml distilled water. Dispersion was transferred to 500ml measuring cylinder. Volume Was made up to 100ml with water. 25 strokes were given and kept it aside. The foam height above the aqueous volume was noted.(21)

2) PH test :-

In 100 millilitres of distilled water, 1 gm of gel-based herbal hand wash was mixed. The pH of the mixture was examined using a previously standardised Digital pH metre.(22)

3) Stability Test :-

The Stability studies were carried out for Polyherbal 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 change in colour and no phase separation were observed in the formulated hand wash.(23)

4) Spreadibility test :-

A sample of 0.5 g of each formula was pressed between two slides and left for about 5 minutes where no more spreading was expected Diameters of Spreaded circles were measured in cm and were taken as comparative values for spread ability. The results obtained are average of three Determinations.(24)

5) Viscosity :-

The viscosity of hand wash was determined by using digital Brookfield viscometer. Measured quantity of herbal hand wash was taken

into a beaker and The tip of viscometer was immersed into the hand wash gel and the viscosity was measured in triplicate.(25)

III. CONCLUSION:-

Traditionally, the conventional methods include washing hands with soil, ash, and water but These methods were not proven as they only clean the hands but they didn't sanitize them. With Swaying time, started using the soaps for washing hands but they were also not hygienic Due to the frequent touching. Moreover, the world was also facing the outbreaks of Communicable diseases such as H1N1 Swine Flu, Bird Flu, Smallpox, Measles, Ebola virus, Marburg, Hantaviruses, and the recent one, COVID 19 coronavirus. It became very necessary to Maintain health and hygiene to overcome these diseases.

Hence, the necessity of hand hygiene Products such as liquid hand wash and hand sanitizers emerged in the modern world. The Increasing demand for hand hygiene products is further supported by the rising prevalence of Various gastrointestinal, respiratory and skin infections among the masses. Alcohol-based hand Sanitizers can minimize the transmission of harmful bacteria and viruses present on the skin or Palm of the hands, thereby reducing the instances of stomach infections, diarrhoea and nausea And vomiting. Hospitals and healthcare centres are also widely using hand wash to prevent the Transmission of hospital-acquired infections (HAIs).

Further, consumers are increasingly becoming aware of the availability of premium personal care And hygiene products and are widely adopting healthy lifestyles. Product vendors are using Innovative marketing strategies to promote sanitation products through influential celebrities and Sports personalities to reach and attract a broader consumer base. They are also developing Attractive

packaging to grab the consumer's attention and provide them with an authentic and Luxurious experience through their high-quality product. This research summary is reflective of The emerging interest of hand hygiene as a preventive measure.

REFERENCE:-

- [1]. Mr. Bhise Akash Bhagwan, Formulation & Evaluation of Herbal Hand Wash By using Natural Ingredient By simple Method, IGCRT, 9(12), 2021 page no. b627.

- [2]. Ramanamma lalam ,etal ,Formulation&evaluation of herbal hand wash ISSN,11(12) page no.182.
- [3]. Padalia U, Salgaonkar S. Development of Anti-Fungal Herbal Hand Wash Gel. International Journal of life science A5 2015, 86-88.
- [4]. Natarajan SB, Shah MA. Formulation Evaluation and Antibacterial Efficiency of Herbal Hand Wash Gel. International Journal of Pharmaceutical Science 23, 2014, 120-124.
- [5]. Sandeep DS,etal , Formulation of antimicrobial polyherabal hand wash RJPT,9(7)2016 ,page no.1.
- [6]. Mr. Bhise Akash Bhagwan, Formulation & Evaluation of Herbal Hand Wash By using Natural Ingredient By simple Method, IGCRT,9(12),2021 page no. b629.
- [7]. Bahuguna M, Kashyap S. Formulation and evaluation of hand wash. World Journal of Pharmaceutical Research. 2016 May 19; 5(7):1559-77.
- [8]. Shah B, Seth AK. Textbook of Pharmacognosy and Phytochemistry. Elsevier India. 2010; First edition: pp 305-306.
- [9]. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3249909/Ocimum sanctum Linn. A reservoir plant for therapeutic applications: An overview> Priyabrata Pattanayak,* Pritishova Behera, Debajyoti Das,1 and Sangram K. Panda
- [10]. Therapeutic uses of *Ocimum sanctum* Linn (Tulsi) with a note on eugenol and its pharmacological actions: a short review PAGN Prakash, Neelu Gupta Indian journal of physiology and pharmacology 49 (2), 125, 2005
- [11]. Review *Ocimum* Species: A Review on Chemical Constituents andAntibacterial Activity Hendra Dian Adhita Dharsono 1,*, Salsabila Aqila Putri 2, Dikdik Kurnia 2, Dudi Dudi 3and Mieke Hemiawati Satari.
- [12]. Lalam R, Kumari V, Likitha KS, Rakesh Y, Bhavani M, Madhuravani V, Dr.Panda J. Formulation and evaluation of herbal hand wash. World Journal Of Pharmacy And Pharmaceutical Science. 2022 Nov 06; 11(12): 192- 197.
- [13]. Health benefits of *Moringa oleifera* ,Ahmad Faizal Abdulla Razis ,Muhammad Din Ibrahim ,Saie Brindha Kntayya.
- [14]. Chaudhary P, Pingale R, Batwal P, Ghode Y, Lodha J, Ajmera V, et al. In-vitro Evaluation of The antibacterial potential of polyherbal hand wash formulation against some skin pathogens.
- [15]. International Journal of Pharmaceutical Science and Research. 2022 Oct 01; 13(10): 4187-4198. (15)REVIEW Review of the Safety and Efficacy of *Moringa oleifera* Sidney J. Stohs* and Michael J. Hartman AdvoCare International, Plano, TX 75074, USA.
- [16]. (16)The Wealth of India,1962; Padmaraoet al., 1996; Dahot, 1988; Ruckmani et al., 1998.
- [17]. (17)<https://www.britannica.com/plant/lemon>.
- [18]. The changes in growth parameters, qualities, and chemical constituents of lemon balm (*Melissa officinalis* L.) cultivated in three different hydroponic systems Yang-Ju Son, Jai-Eok Park, Junho Kim, Gyhye Yoo, Chu Won Nho Industrial Crops and Products 163, 113313, 2021.
- [19]. Jena Jitendra ,etal *Rosa centifolia*: plant Review IJRPC ,2(3) ,2012 page no.794.
- [20]. (20)Ramanamma lalam ,etal ,Formulation&evaluation of herbal hand wash ISSN,11(12) page no.192.
- [21]. Aman Shukla ,etal, Formulation and evaluation of herbal hand wash using ginger rhizomes. IJPPR,2020,19(1) page no.143.
- [22]. Priyanka V. Bagdeetal, Formulation and evaluation if gel based herbal hand wash using extracts of argemone Mexicana, Int. Journal of Pharmaceutical science & medicine(IJPSM), 6(6), 2021, page no.31.
- [23]. Niraj Terkar ,etal, formulation and evaluation of polyherbal hand wash (gel), IJSR, 10(8), 2021, page no. 1216.
- [24]. Mali Kamlesh D,etal, Formulation &evaluation of alcohol free herbal hand wash containing osmium santum IJPBS,10(2) 2020, page no. 115.
- [24]. Megha Bahuguna ,etal, formulation and evaluation of hand wash ,world journal of pharmaceutical research (WJPR), 5(7),2016,page no. 1567.