



FORMULATION AND EVALUATION OF HERBAL HAND SANITIZER CONTAINING GILOY (TINOSPORA CORDIFOLIA)

Bhoomi Sandeep Gupta, Anwesha Garnaik, Gita Mohire

B.R. Harne College of Pharmacy

Abstract: Hand hygiene is a process in which we must clean our hands to prevent germs, viruses and bacteria. Hand hygiene is playing an important role to prevent and to control and to reduce the infection which obtain in healthcare infection. Herbal hand sanitizer is used for safety, because alcohol-based hand sanitizers can cause dryness, itching and irritation. Regular hand sanitizing is important to eliminate the germs and to prevent contamination, while working in the laboratories, hospital and at home. The main aim is to prepare an herbal hand sanitizer containing Giloy's based because its properties have an antioxidant, antimicrobial, adaptogenic, immunomodulatory, antipyretic, anti-inflammatory. Giloy contains many active compounds that have benefit effects which include the- alkaloids, steroids, carbohydrates, flavonoids, terpenoids, and lignans.

Keywords: Hand hygiene, non-alcoholic hand sanitizer, antimicrobial activity, giloy (tinospora cordifolia), infection, herbal extracts.

Introduction: Hand sanitizer is also called a hand rub and hand antiseptic, a product i.e. applied to hand that eliminates the common pathogen from the hands. Hand sanitizers are available in market in the forms of dosage, including gels, sprays, liquids, foams, wipes, and creams. Hand sanitizer is mostly used in the COVID-19 (corona virus disease-2019). In 2019, a virus spread in various countries. Covid-19 is an infection that severe as an acute respiratory syndrome that was 1st isolate and identify in patient who are expose at a sea-food market in Wuhan City, China in December of 2019. WHO (World Health Organization) has declared this pandemic disease and many countries around the world are in lockdown avoiding touching the eyes, mouth and nose when outside, keeping the distance at least 1 meter and clean the hands with hand sanitizer and soap.

What is an herbal hand sanitizer?

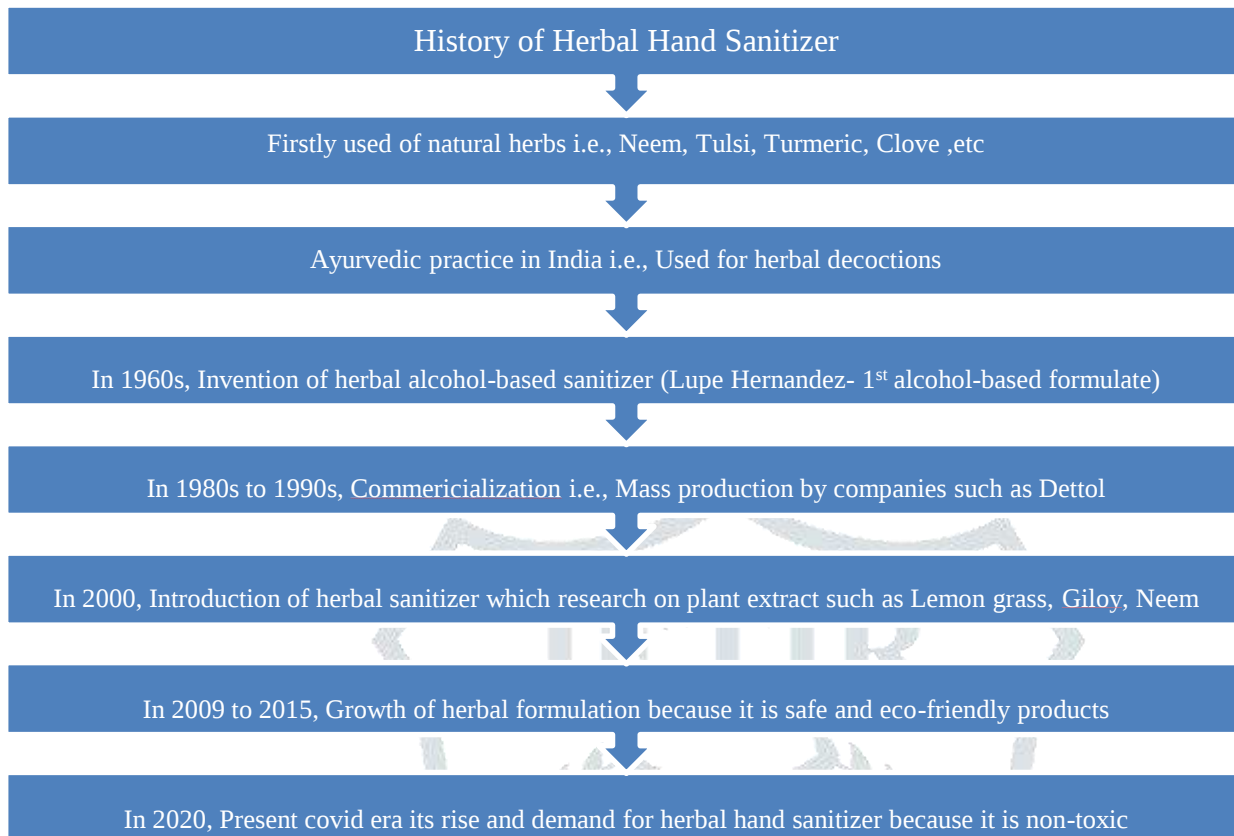
Herbal hand sanitizer is a natural antimicrobial product that made from plant extract that can kills the germs, bacteria while been gentler on the hand. Herbal ingredients used in the hand sanitizer are neem, tulsi, mint, giloy, aloe vera which have properties like antifungal, antiviral. These herbal hand sanitizers aim to provide safe, moisturizing benefits and it reduce the dryness, itching and irritation from the chemicals.

Benefits of Herbal Hands Sanitizer:

1. It is a safe and eco-friendly.
2. It is a moisturizing product.
3. Dryness of the skin is less.
4. Herbal product provides an extra beneficial effect.
5. Less side effect compared to synthetic hand sanitizer.
6. Made from plant that are easily available.

7. Herbal hand sanitizer can decrease about 96% of bacteria.

History:



Steps for applying the herbal hand sanitizer: Duration of the entire procedure is 20 to 30 seconds.

Step 1- Apply sanitizer: Squeeze a palmful of the herbal hand sanitizer into one hand palm to apply it.

Step 2- Rub palm: To evenly distribute the sanitizer, rub your palm together.

Step 3- Back of hands: Interlace your fingers and rub the palm of your right hand over the back of your left hand before switching hands.

Step 4- Interlace fingers: Rub your right hands fingers with your left hands palm to interlace your fingers, then switch the hands.

Step 5- Back of finger: Interlock your fingers by rubbing their backs against your opposing palms.

Step 6- Thumbs: Clasp your left thumb in the palm of your right hand and rotate it, then switch hands. Lastly, use your opposing palms to massage the backs of your fingers.

Step 7- Until dry: Continue rub your hands together until they are completely air dry. Do not rinse with soap and water.

Objectives of herbal hand sanitizer:

1. To formulate the herbal hand sanitizer using herbal ingredients.
2. To promote the bio-degradable and gentle alternative product for hand hygiene.
3. To evaluate its physiochemical properties such as stability, pH, appearance, viscosity, etc.

4. To prevent from cross-contamination.
5. Herbal ingredients provide the skin benefits like antioxidant properties.
6. Conduct the safety testing.

Material: Collection of plant materials-

1. Giloy: Common name: Giloy, Amrita, Heart-leaved Moonseed

Botanical name: *Tinospora cordifolia*

Family: Menispermaceae

Kingdom: Plantae

Active constituent: Alkaloids, Flavonoids, Glycosides, Steroids,

Giloy are also called as Amrita in Ayurveda, is well-known as medicinal herb. The properties of giloy are antiviral, antibacterial, antifungal and immune-boosting properties. Giloy is a greenish stem. It grows in a tropical region of India.



2. Lemon Grass Oil: Common name: Lemon grass, Citronella grass, Fever grass

Botanical name: *Cymbopogon citratus*

Family: Gramineae

Kingdom: Plantae

Active constituent: Citral, Geraniol

Cymbopogon, called as lemon grass, silky heads, oily heads or fever grass. It grows in a tropical and subtropical climate under the plenty of sunshine.



Method: 1) Crude drug extraction for giloy stem: Thoroughly this process, the giloy stems powerful, starchy compound, sattva which is essential component of many Ayurvedic medication, is extracted.

A. Maceration process-

Giloy Stem (Collected and Cleaned)



Shade Drying (5–7 days)



Coarse Powder Preparation



Weigh Required Quantity



Add Solvent (e.g., Ethanol or Hydroalcoholic mixture)



Place in Closed Vessel for Maceration

(Occasionally Stir for 5–7 days)



Filtration of Extract



Concentration of Filtrate

(Using Rotary Evaporator / Water Bath)



Dried Extract



Storage in Airtight Container

B. Decoction process-

Giloy Stem (Collected and Cleaned)



Shade Drying (5–7 days)



Coarse Powder Preparation



Weigh Required Quantity



Add to Distilled Water (Specific Ratio, e.g., 1:8)



Boil for 30–45 minutes (Until volume reduces to 1/4)



Cool and Filter



Concentrate Filtrate (if needed)



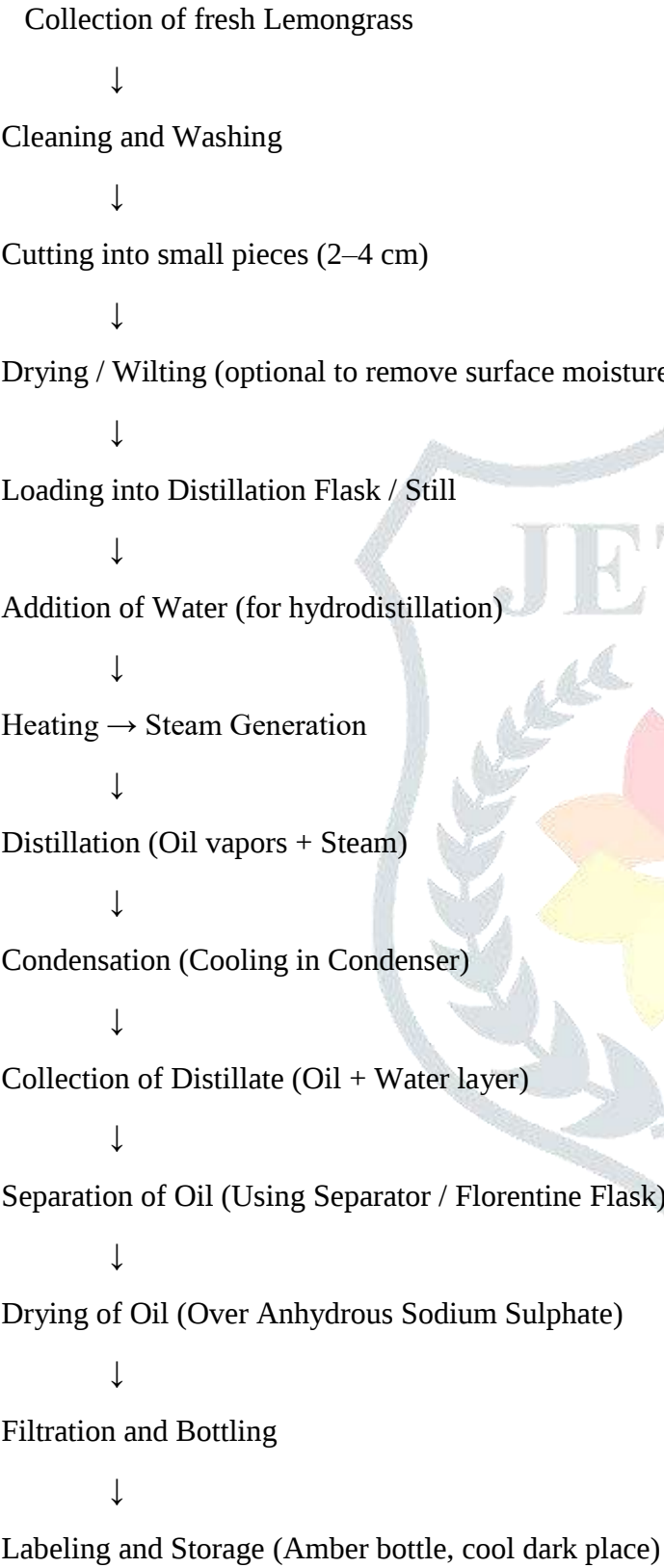
Dry Extract (Water Bath)



Store in Airtight Container at Cool Place

II) Crude drug extraction for lemon grass oil:

Hydrodistillation/Steam-distillation-



Formulation of Herbal Hand Sanitizer:

Sr. No.	Ingredients	Properties

1.	Giloy	Antibacterial, antioxidant, anti-inflammatory
2.	Aloe vera gel	Hydration, moisturizing, healing, antimicrobial
3.	Glycerin	Humectant, solvent, co-solvent
4.	Carbopol	Thickening and gelling agent
5.	Triethanolamine (TEA)	pH adjuster
6.	Distilled water	Vehicle
7.	Lemon grass oil(optional)	Antifungal, natural fragrance

Evaluation of Herbal Hand Sanitizer: Herbal hand sanitizer is evaluated to check their physiochemical and microbiological parameters to ensure its safety, stability, etc.

- 1) **Organoleptic Evaluation-** To check the general appearance such as color, odor, clarity, appearance, consistency.
- 2) **pH Determination-** pH is measured using the digital pH meter at room temperature. The suitable range for skin is 5.5 to 7.0 for all skin type.
- 3) **Viscosity Measurement-** Viscosity is measured using the Brookfield viscometer method. To ensure the appropriate flow and spreadability of the liquid or gel sanitizer.
- 4) **Spreadability Test-** Squeeze the sanitizer and placed between the two glasses slide and pressed.
- 5) **Skin Irritation Test-** Take a small amount of sanitizer and applied on human skin for some times to check the irritation like redness, itching.
- 6) **Stability Study-** Sanitizer store in different temperatures such as 25°C, 37°C and 45°C for 40 to 60 days and check the color, pH, odor, phase separation.
- 7) **Antimicrobial Efficacy Test-** This test is performed to use a agar diffusion method against microorganisms like E. coli, Pseudomonas aeruginosa.
- 8) **Drying Test-** Squeeze the small quantity of sanitizer on hands and check the time taken for dry.

Conclusion: The most frequent way for pathogens to spread to patients is through the hands, so maintaining good hand hygiene can stop the spread of antibiotic resistance and infections linked to medical care. The herbal hand sanitizer made from giloy demonstrated favorable qualities like stability, skin friendliness, and strong antimicrobial activity. The formulation might be herbal product that isn't currently on the market but could be made better and sold.

Acknowledgement: For her invaluable advice, inspiration, and unwavering support during the review and completion of my project on "Formulation and Evaluation of Herbal Hand Sanitizer," I would like to sincerely thank my esteemed guide, Mrs. Anwesha Garnaik. Her motivation and astute advice have been crucial to the accomplishment of this work.

References:

1. Yu SHI, Gang WANG, Xiao-peng CAI, Jing-wen DENG, Lin ZHENG, Hai-hong ZHU, Min ZHENG, Bo YANG, Zhi CHEN, 2020. An overview of COVID-19. *Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology)*, 21(5): 343-360.
2. Tejasvee R. Shinde, Guided by Mr. Dattaprasad N. Vikhe. Herbal hand sanitizer. *International Journal of Pharmaceutical Research and Applications*, Volume 7, Issue 2, pp: 489-496, Mar-Apr 2022.
3. Prof. Ankita Bankhele, Vaibhav Kakde, Prapti Kamble. A review on extraction method and formulation process of *Tinospora Cordifolia*. 2022 IJRTI, Volume 7, Issue 8. ISSN: 2456-3315.
4. Ritika Panwar, Anchal Raj, Suchitra Thapa. Potential role and assessment of medicinal properties of giloy. *International Journal of Pharmacognosy and Life Science* 2023; 4(2): 12-20.
5. Parixit Prajapati, Heli Desia and Chandni Chandarana. Hand sanitizer as a preventive measure in COVID-19 pandemic, its characteristics, and harmful effects: a review. Prajapati et al. *Journal of the Egyptian Public Health Association*, 2022, 97:6.
6. Puput Wanarti Rusimamto, Nurhayati, Eppy Yundra, Reza Rahamadian. Automatic hand sanitizer container to prevent the spread of Corona Virus Disease. *International Joint Conference on Science and Engineering (IJCSE 2020)*, Volume 196.
7. Dingar Amrut, Deshmukh Swamini, Fulpagare Nishant. *International Journal of Pharmaceutical Sciences*. 2025, Volume 3, Issue 5, 545-549.
8. Junaid S. Shaikh, Shashikant D. Barhate. Formulation and evaluation of antibacterial herbal soap incorporating nagkesar and giloy.
9. Varsha Walunj, Sumit Walke, Sonal Waykar. Non-alcohol pure poly herbal hand sanitizer-formulation and evaluation. *Journal of Emerging Technologies and Innovative Research (JETIR)*. 2024; Volume 11, Issue 1.
10. S Kiruthika, N Uma Maheshwari. Formulation and evaluation of polyherbal hand sanitizer. *International Journal of Botany Studies*. 2021; Volume 6, Issue 3, page no. 184-187.
11. Rutuja Sunil Patankar, Dr. Nayna Chandak. Formulation of herbal sanitizers and determining their antimicrobial activities against skin pathogens. *International Journal of Innovative Science and Research Technology*. Volume 3, Issue 8, August-2018.
12. Dipti Singla, Kamna Saini. *International Journal of ChemTech Research*. Volume 12, pp: 114-120, 2019.
13. Suvarna Bhadane, Dr. Smita Takarkhede, Pooja kakade. Formulation and evaluation of herbal hand sanitizer. *World Journal of Pharmaceutical Research*. Volume 11, Issue 4, pp: 695-705, 2022.
14. Jyotsana Singh Chandravanshi, Shazia Mansoor, Asha Agarwal. Formulation and evaluation of herbal hand sanitizer from Indian herbs. 2021. Volume 11, Issue 3:1-17.
15. Blessy Jacob, Md. Salim Reja, V. Chandy. Formulation and evaluation of herbal hand sanitizer against some common microorganisms. *Research and Reviews: A Journal of Pharmacognosy*. ISSN: 2394-7276, Volume 7, Issue 1, 2020.

16. Vishal Verma, Deepak Choudhary, Ashima Chandel. Formulation and evaluation of herbal hand sanitizer. International Journal of Novel Research and Development (IJNRD). 2023, Volume 8, Issue 4, ISSN: 2456-4184.
17. Sheetal Sarraf, Subhranshu Panda. Formulation and evaluation of herbal hand sanitizer based on plants producing essential oil. European Journal of Medicinal Plants. Volume 35, Issue 6, Page 249-258; 2024.
18. Shaloo, Shayna Shafi, Simran Singh. Formulation and development if mint containing herbal hand sanitizer. European Journal of Pharmaceutical and Medical Research. 2017, Volume 4, Issue 11, 454-457.

