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FORMULATION AND EVALUATION OF POLYHERBAL HAND WASH

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ABSTRACT
The present study focuses on the formulation and evaluation of a polyherbal hand wash aimed at providing effective hand hygiene using natural ingredients, minimizing the risk of skin irritation commonly associated with synthetic products. The formulation incorporates extracts of Azadirachtolides (Neem), Ocimum tenuiflorum (Tulsi), Mentha arvensis (Pudina), Syzygies aromaticum(Clove), and Sapindas mukorossi (Ritha), all known for their antimicrobial and cleansing properties.
Five different formulations were developed and evaluated based on key physicochemical parameters such as appearance, pH, viscosity, foam height, foam retention, spread ability, and skin irritation potential. Antimicrobial efficacy was assessed using the agar well diffusion method against Staphylococcus aureus and Escherichia coli. Among the formulations, one showed optimal antibacterial activity and was found to be non-irritant and stable, with acceptable aesthetic and application characteristics.
This study demonstrates that a polyherbal hand wash composed of plant-based ingredients conserve as an effective, safe, and eco-friendly alternative to conventional chemical-based hand cleansers, with potential for commercial scalability.

Keywords:
Health Care, Delivery System, Rural Health, GIDA, Philippine Health Agenda,

INTRODUCTION

Washing of Hands with soap and water has been integral Part of life for our personal hygiene from hundreds of years and has been very much useful as spiritual and cultural well Hand washing avoids the ingestion of Microbes in o the body Cavities and so as leads to stoppage of spreading of disease, discoveries of Pasteur and Lister Explained the Applications and essentials for washing.

In the middle of 19th century, Ignaz Semmelweis in Vienna (Austria), and Oliver Wendell Holmesian Boston (USA), noted in their Research that the hands of health care workers spread nosocomial infection.

In 1847, observations of Semmelweis Noted that after performing autopsies physician hands are found to be smells with Disagreeable Oduor which initiate the use of Soap and water or proper handwashing before entering the in to the clinic.

Hand washing is the most efficient way to prevent the transmission of bacteria that cause diarrhea, influenza, and the common cold.

It is the easiest, most significant, and least expensive technique to promote hand cleanliness health care and aid in the prevention of infectious disease.

The WHO standard requires people to wash their hands with no antibacterial soap and water.

The time duration ranged on average as short as 15 to 30 seconds, including rubbing the backs of hands, wrists, between fingers, and under fingernails. Hand washing with Poly herbal hand washes and water is 25% more

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effective than washing with water alone in removing bacteria. According to studies, only about 40% of healthcare workers, homeowners, and officers follow hand- washing procedures.

Microbial infections impact the skin, which is one of the most vital areas of the body. Hand washing is essential for protecting the skin from harmful germs and preventing the spread of communicable diseases

Management must teach food production laborers and food service personnel how to properly wash their hands and fingertip in preparation for work.

Any healthcare worker, caretaker, or individual involved in direct patient care must be concerned about hand

As a result, we set out to make and test an herbal hand made up of alcoholic extracts. Plants have historically become a good source of anti-infective and antimicrobial agents.

Plant extracts have the potential to act as antimicrobial compounds against a variety of pathogenic microorganisms that cause infections, disease,and drug resistance

The primary benefit of using natural sources is that they are readily available, inexpensive, and safe when compared to chemical products .

LITERATURE REVIEW

Rotter M, et.al 1999

The purpose of hygienic hand disinfection is to render hands safe after contact with pathogens. Comparing effects of disinfection procedures on infection ratios is too difficult for routine purposes but the degerming efficacy may be determined in laboratory tests with volunteers.

Jumaa PA, et.al 2005

This review gives an overview of hand hygiene in healthcare and in the community, including some aspects which have attracted little attention, such as hand drying and cultural issues determining hand hygiene behaviour. Hand hygiene is the most effective measure for interrupting the transmission of microorganisms which cause infection both in the community and in the healthcare setting.

OBJECTIVES

Aim:

To formulate and evaluate a polyherbal handwash using natural herbal ingredients with proven antimicrobial, antifungal, and skin-soothing properties, providing an effective and safe alternative to synthetic chandwash formulation

Objective

1.To select suitable herbal ingredients with antibacterial, antifungal, antiviral, and skin- nourishing properties (e.g., Neem, Tulsi, Aloe vera, Lemon, Turmeric, etc.).

2. To formulate a stable and effective polyherbal handwash by incorporating the selected herbal extracts in appropriate proportions.

3. To evaluate the physicochemical properties of the handwash, such as:
   - pH
   - Viscosity
   - Color and appearance
   - Foaming ability
   - Spreadability

3. To assess the antimicrobial efficacy of the polyherbal handwash against common skin pathogens like Staphylococcus aureus, E. coli, and Candida albicans using standard microbiological methods.
4. To perform skin irritation tests (in vitro or in vivo) to ensure safety and suitability for human use.

- **Ideal Characteristics of Hand Wash**

1. It should be with good Foaming Index.
2. It should be not Cause any Irritation to the skin.
3. It should be clear and free from Particulate Matter.
4. It should contain appropriate amount of Antimicrobial Substance.
5. It should contain Fragrance to overcome with the Bad Odour of Hands.
6. It should contain enough spread ability in order to get Maximum su.

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➢ **Materials Equipments and Methods**

1. Water Bath
2. Beaker
3. Conical flask
4. Mechanical flask
5. Glass roads
6. Measuring cylinder
7. Weighing balance
8. Filter paper
9. Funnel
10. Hot plate/ heating mantle
11. pH meter
12. Spatula 13Glass bottle
13. Magnetic stirrer with hot plate
14. Viscometer
15. Petridish
16. Incubator
17. Micropipette or dropper
18. Zone reader or ruler
19. Foam measuring
20. Glass plate

Materials &Equipment's

Sr. no	Ingredients	Quantity/ml	Uses
1	Neem	25	Antimicrobial Agent
2	Tulsi	25	Purifying Agenty
3	Pudina	15	Antibacterial Agent
4	Clove oil	0.88	Antibacterial Agent
5	Ritha	15	Foaming Agent
6	SLS	7.5	Foaming Agent
7	Carbopol940	15	Geling Agent
8	Methyl paraben	1.5	Preservative
9	Glycerin	6.2	Softening Agent
10	Rose oil	Q. S	Perfume
11	Distilled water	Up to 250 ml	Vehicle
12	Turmeric	Q. S	Colarants

➢ **Formulation table**

INGRREDIENT WITH MONOGRPH

NEEM

- Synonyms :- HolyTree ,Margosa
- BIOLOGICAL SOURCE :- It is obtained from fully matured seeds of Azadirachta Indica Linn.
- Family :- Meliaceae
- Uses :- 1) Nimbin, Nimbidin and related compound Possess potent anti microbial
- activity.
- 2) As non-edible oil, it is used to soap makin

Tulsi

- Synonym :- Sacred Basil, Holy basil
- Biological Source :- Tulsi consist of fresh and dried leaves of ocimum sanctum linn.

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- Family :- Lamiaceae
- Uses :- 1) Tusli is used as purifying agent.
- The fresh leaves juice and volatile Oil used stimulant aromatic.

PUDINA :-

- Synonym :- Oleum mentha piperita , Oleum mentha piperita lpermin
- Biological source :- It is obtained from fresh
- flowring top'sof the plant Known as Mentha piperitalinn
- Family :-Labiate
- Uses :-1) Mentha oil is used as Antibacterial Agent.
- It is used as Carminative agent,

CLOVE OIL

- Synonym :- Caryophyllum, clove flower
- Biological source :- Clove consist of dried flower buds of eugenia Caryophayllus
- Family :- Myrtaceae
- Used :- 1) Clove used as antibacterial.
- Clove is used as Carminative.

Ritha

- Synonym :- Soapunt,Soapberry,washnut,ritha
- Biological Source :- It is obtained from Spindus mukorossi
- Family :- Spindaceae
- Uses :- 1) Soapnut is used as foaming agent
- 2) It is used as detergentbefore dying or for hand wash also

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METHODOLOGY

Extraction of plant material

25grams of each dry plant Powdermaterial were added in water mixed it by using Stirrer, The mixture was then heated on water bath at 60°C for 1 hour, and then filtered through Filter Paper to get the Particle free Extract , followed by adding of Fragrance Solution followed by stirring and allowing to be stable at Room Temperature .

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METHOD OF PREPARATION

- Polyherbal Hand wash Gel was preparedusing Carbopol940 as Gellin agent which is socked in 15ml distilled water overnight.
- Neem and Peppermint extracts, Ritha Powderalong with Tulsi and Clove oil were measured accurately and dissolved by gentle heating
- After heating, keep the solution aside for sometimes.
- The required quantity of Sodium lauryl Sulphate dissolved in 10ml distilled water along with Glycerine were mixed in above aqueous phase with continuous stirring
- The methyl paraben was dissolved in remaining quantity of purified water and dispersed into extract
- The swelled polymer (Carbopol 940) was stirred using mechanicalstirrer to ensure the uniform dispersion. Polymer and finally added into the above mixture to forma Homogenous Gel and then the required quantity of Rose oil was added for Fragrance.

IMAGE OF FORMULATION

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➢ RESULTS AND DISCUSSION

Sr. No	Evaluation parameter	Formulated Polyherbal Hand wash gel
1	Colour	Brownish yellow
2	Odour	Rose like
3	Texture	Smooth
4	Apperance and homogneity	Translucent
5	Grittiness	Non gritty
6	Skin irritation	Non irritation
7	PH	7.92
8	Foam rentaion	15 ml
9	Stability	Stable

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CONCLUSION

- As per WHO , “ 80% of the population of Asian country presently use herbal medicine for primary health care and for the purpose of hand hygiene as a Hand wash, in the the present study we have formulate Polyherbal Hand wash containing herbal extract which is having not only cleaning Aid Property but also Sufficient Antimicrobial Property also.
- Itscomposition was prepared according to delicateness of skin so that it cannot cause any type of irritation.
- Hence, it can be concluded that the Polyherbal Hand wash can be a best Safest and Effective Alternative Approach for other Marketed Hand wash Preparations.
- n the pharmaceutical industry, there are numerous marketed liquid formulations such as polyherbal hand wash. Out of them, we found mostly chemical-based preparation.
- Before evaluation, in these five formulations of Azadirachta indica (Neem), Ocimum tenuiflorum (Tulsi), Mentha arevensis (Pudina), Syzygium aromaticum(Clove), Ritha (spindus mukorossi),were used forextraction.
- We have various types of evaluation tests, right from color, odor, and pH to after-feel. It is the middle viscosity test (Brooke field viscometer), non-irritancy, spreadability,washability, etc. The result is good & ready for human

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