

A Review Article on Formulation of Poly- Herbal Hand Wash with Antimicrobial Activity

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Abstract: Hand hygiene is vital principle and exercise in the prevention, control and reduction of health care acquired infections. To avoid the adverse effects like itching, irritation, dermatitis etc., of the synthetic hand wash formulations an attempt has been made to formulate a polyherbal hand wash by using herbs which have antimicrobial property. The ethanolic extracts of leaves of *Mimosa pudica* (touch me not), *Azadirachta indica* (neem). The antimicrobial activity of prepared hand wash formulations was checked against skin pathogens *Bacillus subtilis*, *Escherichia coli*. herbal formulations showed significant antimicrobial activity than the commercially available standard hand wash (synthetic-dettol, herbal-pathanjali). So these plants materials can be used in the preparation of herbal hand wash on commercial scale.

Keywords: Ploy herbal hand wash, Antimicrobial activity, *Mimosa pudica* and *Azadirachta indica*

I. INTRODUCTION

Hygiene is defined as maintenance of cleanliness practices which carries utmost importance in maintenance of health^[1]. skin being the most exposed part of our body requires protection from skin pathogens. The hands of Health Care workers (HCWs) are the primary routes of transmission of multidrug resistant pathogens and infection to the patients. Hence, it brings up the use of antiseptic for hand wash purpose. Many of the chemical antiseptics are now available in market as alcohol based sanitizers, chlorhexidine products etc. Hand washing removes visible dirt from hands and reduce the number of harmful microorganisms. Harmful bacteria and viruses such as, *E. coli* and *Salmonella* can be carried by people, animals or equipment and transmitted to food.^[2] Plant extracts and products have been used for centuries in traditional medicine, functional food etc.. The main advantage of using natural source is that they are easily available, cheap and harmless compared to chemical products. Therefore research has been increased tremendously towards making natural products with improved quality yet less expensive and no side effects over chemical product^[3]. Antimicrobial properties of certain Indian medicinal plants were reported based on folklore information and only few reports are available on inhibitory activity against certain pathogenic bacteria and fungi. Use of plants as source of medicine has been inherited and is an important component of the health care system in India^[4].

Mimosa pudica L. (Fabaceae) also referred Touch me not, Shameful plant, live and die. Leaves of this plant contain alkaloids, tannins, sterols, terpenoids, fatty acids and flavanoid glycosides which are responsible for the antimicrobial activity.^[5] it also possess antivenom, antifertility, anticonvulsant, antidepressant, aphrodisiac and various other pharmacological activities^[6].

Azadirachta indica (Meliaceae) also referred Neem, margosa tree or Indian lilac. various parts of neem tree have been used as traditional ayurvedic medicine in india. neem leaves possess Terpenoids, alkaloids, tannins, saponins, flavanoids, amino acids^[7]. It has wide spectrum of antimicrobial activity against gram-negative and gram-positive microorganisms. It is also used in many medicinal treatment like skin diseases, healthy pair, improve liver function, detoxify the blood, pestand disease control, fever reduction, dental treatments, cough, asthma, ulcers, piles, intestinal worms, urinary diseases etc^[8]. Hygiene is defined as maintenance of cleanliness practices which carries utmost importance in maintenance of health^[1]. skin being the most exposed part of our body requires protection from skin pathogens. The hands of Health Care workers (HCWs) are the primary routes of transmission of multidrug resistant pathogens and infection to the patients. Hence, it brings up the use of antiseptic for hand wash purpose. Many of the chemical antiseptics are now available in market as alcohol based sanitizers, chlorhexidine products etc. Hand washing removes visible dirt from hands and reduce the number of harmful microorganisms. Harmful bacteria and viruses such

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II. METHODS

2.1 Collection of Plant Materials

Mimosa pudica (Touch me not) was collected from Kondaveedu fort, *Azadirachta indica* (Neem) was collected from SIOP, Belhe.

Azadirachta indica

Common name – Neem
Botanical Name – *Azadirachta indica*
Kingdom – Plantae
Division – Magnoliophyta
Class – Magnoliopsida
Order – Sapindales
Genus – *Azadirachta*
Species – *A. indica*
Family – Meliaceae

Mimosa pudica

Common Name – sensitive plant
Botanical Name – *Mimosa pudica*
Kingdom- plantae
Division- Tracheophyta
Class- Magnoliopsida
Order- Fabales
Genus- *Mimosa*
Species- *M. pudica*
Family – Fabaceae

2.2 Extraction of Plant Materials

Collected leaves of *Azadirachta indica*, *Mimosa pudica* were air dried and powdered using mixer grinder. 10gms of coarsely powdered leaves of both plants were soaked in 200 ml of ethanol 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.

2.3 Formulation of Herbal Handwash

Ingridient	Quantity
Methanolic extract of Azadirachtaindica, Mimosa pudica.	40 ml
Sodium lauryl sulphate	6 gm
Glycerin	40 ml
Methyl paraben	0.3 gm
Rosemerry oil	5 ml
Purified water	100 ml

Hand wash prepared using 40 ml methanolic acid filtrate . to this filtrate 6 gm of SLS , glycerin 40 ml , 0.3 gm methyl paraben , 5ml of rose merry oil is used and the volume is made up of 100 ml purified water.

2.4 Evaluation Test

The prepared hand wash evaluated for following parameter:

Organoleptic Evaluation

1. **Colour:** The colour of the formulation was checked out against white background.
2. **Odour:** The formulation was evaluated for its odours mellingit.

Physicochemical Evaluation

Determination of pH

pH was measured by using digital pH meter within 24hrs of preparation.

Determine % of Solid Content

A clean and dry evaporating dish was weighed and add 3 gm of herbal hand wash to the evaporating dish. The exact weight of hand wash was calculated only and put the evaporating dish with hand wash in hot air oven until the liquid portion was evaporated. The weight off hand wash only (solid) calculated.

Dirt Dispersion Test

Two drops of handwash were added in test tube containing 10 ml of distilled water. One drop of ink was added in the test tube, and stopped the test tube then shake for 5 mins. The amount of ink in the foam was estimated as none, light, heavy or moderate.

Foaming Ability

5ml ml of the handwash was put into test tube and covered the test tube with hand and shaken for 10 times were recorded. The total volume of foam content after 1 minute shaking. The foam volume was calculated only.

Stability Test

Stability and acceptability of organoleptic properties (odour and colour) of formulation during the storage of 2 months indicated that they are chemically and physically stable.

Eye Irritation test

The eye and skin irritation test revealed that the herbal handwash shows no harmful effect on skin, hand and eye. This is due to the absence of synthetic surfactants. Most of the synthetic surfacetants produce inflammation of the eyelid and hand irritation. But in this formulation of herbal handwash, the uses of all ingredients are obtained naturally. So it does not produce any harmful effect on skin , hand and eye.

Biological Activity

In pharmacology, biological activity or pharmacological activity describes the beneficial or adverse effects of a drug on living matter. Biological activity is the capacity of a specific molecular entity to achieve a defined biological effect target.

Antimicrobial Activity

III. PROCEDURE

3.1 Method

1. The screening of antimicrobial efficacy of the formulated polyherbal handwash was performed on E.coli microbes by using cup plate method.
2. In a conical flask take 50ml distilled water, add 2.4gm of nutrient broth and mix it well then add 3.9gm nutrient agar and mixed slowly and again add the 50ml distilled water.
3. Place above mixture in autoclave for 30 min.
4. Take two petri plates which placed in sterile area.
5. The plates are filled with the nutrient broth and nutrient agar medium and allowed for solidification.
6. After solidification microbial culture are prepared by using the bacteria E.coli.
7. The microbial culture containing E.coli spread on the solidified media.
8. Two cavity were made in the solidified media by using borer. the first cavity filled with
9. prepared herbal handwash and second one is filled with methanol (solvent).
10. It was taken care that sample should be placed at level of cavity.
11. The plates are placed in the incubator at 37⁰C to test activity.
12. After 48 hours the plates were observed for formulation of zone of inhibition.
13. From zone of inhibition antimicrobial activity of formulation is estimated.



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