RESEARCH ARTICLE

Development of anti-fungal herbal Hand wash gel

Salgaonkar Snehal* and Padalia Unnati

Department of Microbiolog, K.J. Somaiya College of Science and Commerce, Vidyanagar, Vidyavihar, Mumbai-400077.
*Corresponding author Email: snehalsalgaonkar28@gmail.com

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ABSTRACT

One of the primary modes of transmission of micro-organisms are our hands. Hand-washing is important in food production, food service and day care preparations. Hence it brings us to the use of antiseptic for hand washing purposes. Many of the antiseptic available in market are alcohol based sanitizers which have some shortcomings or adverse effects. Their frequent use can lead to skin irritation. The present research was aimed to evaluate the anti-fungal efficacy of herb and plant material such as Lemongrass and Bermuda grass by agar-cup method of these plant extracts that were obtained by soxhlet extraction. Also the research was carried out to formulate and evaluate the herbal hand wash liquid containing the above extracts. The anti-fungal activity of the formulated hand wash gel was tested against *Aspergillus niger* by Agar Cup Method. Thus this work suggests and supports the incorporation and utilization of herbs and traditional plant materials in the formulation to give better anti-fungal effect. The further development should be performed to achieve broad antifungal activity with different extracts.

Keywords: herbal hand wash gel, *Aspergillus niger*, antifungal activity, plant extracts..

INTRODUCTION

One of the primary modes of transmission of micro-organisms are our hands. Hand-washing is important in food production, food service and day care preparations (Ravi *et al.*, 2005). Contaminated hands can serve as vectors for the transmission of microorganisms. Pathogenic microorganisms responsible for outbreaks are spread from the hands of the food handler to others when the food handler contaminates his/her hands and then passes these microorganisms to consumers via hand contact

with food or drinks. The consumer is exposed following the ingestion of these microorganisms, which may cause gastrointestinal illness. Hand contact with ready-to-eat foods represents a very important mechanism by which pathogens may enter the food supply (NDSC, 2004). To protect the skin from harmful micro organisms and to prevent spreading of many contagious diseases, hand washing is absolutely an important precaution (Snyder and Paul, 1988).

Many of the chemical antiseptics are now available in market as alcohol based sanitizers, chlorhexidine products etc. These soaps or solutions help to reduce health care associated transmission of contagious diseases more effectively but they have some shortcomings or adverse effects. Their frequent use can lead to skin irritation and also resistant among pathogens (Luby and Agboatwalla, 2005). Organism such as *Aspergillus niger* is one of the causative agents of the skin infections. Since fungal infection are always almost everywhere and are just waiting for an opportunity to strike, maintaining a very hygienic lifestyle and putting extra effort on taking care of yourself will pave a long way. It boils down to treatment and prevention to save you from any kinds of fungal infection. Some studies been conducted have shown that resistance to chemical antiseptic have led to outbreaks. Historically, plants have provided a good source of anti-infective agents. India is a rich country in biodiversity. For millennia, traditional healers have used the rich flora to cure ailments. The same plants are being used today. Traditional plants-as cure continues to be very popular since the large part of the population has either no access to, or no resources to afford western treatments. These plant based antimicrobials represent a vast untapped source for medicines. They are effective in the treatment of infectious diseases while simultaneously mitigating many of the side effects that are often associated with synthetic antimicrobials. Plants containing flavonoids and polypeptides used in traditional medicine have been found to be active against a wide variety of micro-organism.

In the present research**:** *Cymbopogon citrates* and *Cynodon dactylon* are been selected in preparing herbal anti-fungal hand wash gel.

Cymbopogon citrates: Lemongrass is a well known medicinal herb in the east. Lemongrass in skin formulations is used to treat acne, cellulite, and other skin problems. Unlike harsh chemical sprays, the scent of lemongrass is very pleasant.

Cynodon dactylon**:** Bermuda grass has many health as well as medicinal benefits. Durva grass is loaded with medicinal uses that can be used as home remedies. Durva grass is used as antiviral and antimicrobial. In India, Bermuda grass is considered as sacred plant, which has great significance in ayurveda because of its medicinal as well as clinical properties.

MATERIAL AND MATERIALS

Plant collection

Samples of *Cymbopogon citrates* and *Cynodon dactylon* were collected during july-august (2015) from mumbai market, Maharashtra, India.

Preparation of plant extracts

The plant materials were sun-dried.

After drying, the material is made into fine powder with the help of grinder and each plant material is weighted. 20 gm of coarse powder of plant material to be extracted separately in 200 ml of acetone using soxhlet extractor for 6hrs/sample. Temperature to be maintained till the boiling point of acetone i.e. 56°c. The extract is separated from the solvent with the help of evaporation. The solvent vapourises, leaving the extract which is then oven-dried.

Anti-fungal assay

The anti-fungal activities of the extracts were determined by agar-cup method technique (Rose and. Miller 1939a) against *Aspergillus niger*. Mueller-Hinton agar was used as a culture

medium. The culture was swabbed over the agar plates and then wells were punched with a 0.85cm cork-borer. 0.1 ml of the extract was introduced into the well. The plates were incubated for 48hrs at room temperature.

Formulation of herbal hand-wash gel

KOH-Water mixture was added to a separate beaker which was placed in a boiling water bath. The desired concentration of foaming agent was measured accurately and dispersed in the KOH-water solution with moderate stirrer speed. Desired quantity of the extracts, colorant were added to the formulation along with boiling water. PEG was added to adjust the pH. The paste was then neutralized and diluted. The formulated hand wash was then filled in a suitable container and stored at a cool and dry place.

Anti-fungal studies of the herbal hand wash

The anti-fungal studies of the herbal hand wash gel were studied by agar-cup method technique (Rose and. Miller 1939) against *Aspergillus niger* with Mueller-Hinton agar as a culture medium. The culture was swabbed over the agar plates and then wells were punched with a 0.85cm cork-borer. 0.1 ml of the formulated hand wash was introduced into the well. The plates were incubated for 48hrs at room temperature.

RESULTS

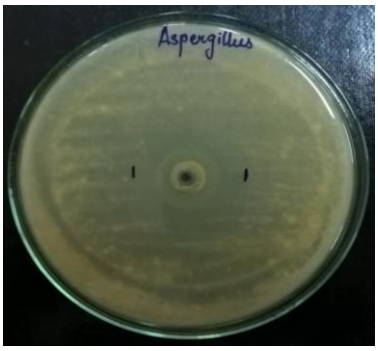

Fig.1: Hand wash showing antifungal activity

The results of the agar cup method of the acetone extracts of lemongrass and Bermuda grass against *Aspergillus niger* showed significant results. Hence it was encouraging to be used in the preparation of herbal hand wash gel. The hand wash showed greater antifungal activity (fig.1). Thus, the potency of the herbal hand wash against *Aspergillus niger* is very remarkable.

CONCLUSION

In conclusion, based on the above findings it is clear that lemon grass and Bermuda grass is active against Aspergillus niger. The results clearly prove that the herbal hand wash gel thus prepared is far more active. It can be stated that the active compounds in the hand wash are more effective in killing or removing organisms than the chemicals that are used. Thus these compounds can be extracted and incorporated in hand wash formulation in order to prepare superior antiseptic herbal hand wash gel with little or no side effects. Thus, a new way can be found to provide safe and healthier living through germ-free hands. Although the removal is not 100% but a major number can be reduced.

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