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Evaluation and Formulation of Okra Seed Extract Containing Alcohol based Hand Sanitizer

Nikhil Nagesh Malji
D.S.T.S Mandal's College of Pharmacy, Solapur, Maharashtra

Abstract:- The main aim for the preparation of a hand sanitizer is for "hand hygiene". It is main principle in the prevention, control, and reduction in infection. Mainly hand sanitizer can stop the transmission of micro organism and other bacteria from different parts of our body. Hand sanitizer avoids adverse effects like itching, irritation etc. So, maintaining hand hygiene an attempt has been made to formulate and hand sanitizer by using extract of okra seed. The formulation was evaluated for its physical parameters. It is concluded that the formulation is an effective sanitizer.

Keywords: *Okra Seed Extract, Sanitizer, Anti Bacterial Activity, Hand Hygiene.*

I. INTRODUCTION

Hygiene is defined as the maintenance of the practice of cleanliness which is of most important in the maintenance of well being. Skin is the most exposed to the environmental pollution and against the pathogen. To protect the skin from harmful micro organism and to prevent spreading of many skin infection hand hygiene is an absolutely an important precaution. Usually, microbes residing on the hands are divided into resident and transient. Resident microbes like Staphylococcus aureus and transient microbes like Gram negative bacilli.

The recent trend in the emergence of bacterial infection with reduced susceptibility to antibiotics has led to the search of natural, safe and potent antibacterial agent rather than the synthetic drugs with toxicity. Plants and its products have been used as source of food, supplements and therapeutic agents for animals and human due to the huge presence of chemical substances such as alkaloids, carbon compounds, lectins, nitrogen, glycosides, essential oils, fatty oils, resins, mucilage, tannins, gums, lactones. Hand sanitizer is a liquid generally used to decrease infectious agents on the hands. Formulations of the alcohol-based type are preferable to hand washing with soap and water in most situations in the healthcare setting. It is generally more effective at killing microorganisms and better tolerated than soap and water. Hand washing should still be carried out if contamination can be seen or following the use of the toilet. The general use of non-alcohol based versions has no recommendations. Outside the health care setting evidence to support the use of hand sanitizer over hand washing is poor. They are available as liquids, gels, and foams.

Alcohol based sanitizer contains some combination like isopropyl alcohol, ethanol etc. sanitizer which contains the 65 to 95 % of alcohol are more effective. Alcohol based sanitizers are effective against various micro organism but not the spores.

II. OBJECTIVES

To develop the most effective hang hygiene product to meet patient compliance. To evaluate the prepared hand hygiene product to establish desired effect on patient. The objective of hand sanitizer is to protect the skin from harmful micro organism and to prevent the spreading of infection.

III. MATERIAL AND METHOD

A. Selection of Material

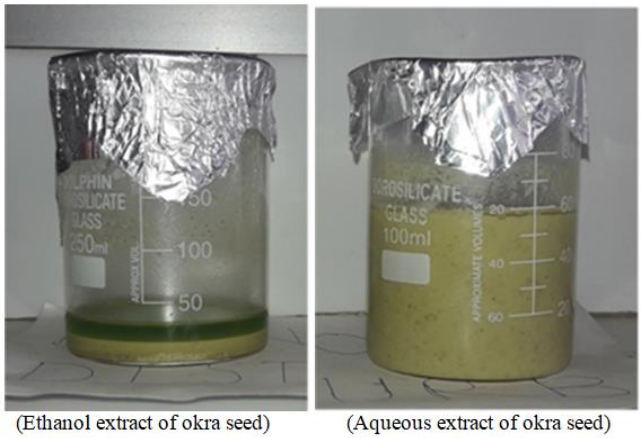
In the present study, antibacterial effect of okra seed extract is done which claim to have the potential against various microorganisms.

B. Collection of Material

Fresh immature pods of Okra were collected from local market. The pods were washed thoroughly with sterile distilled water and seeds were separated from the pods, dried and pulverized to fine powder using grinder and used for extraction.

➢ *Extraction*

For extraction about 50 grams of the ground seed was dissolved in 200 ml of sterile water and ethanol respectively and left for 48 h at room temperature. After 48 h, the mixture was filtered using clean muslin cloth and the filtrate was used for formulation.



(Ethanol extract of okra seed) (Aqueous extract of okra seed)

Fig 1

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➢ *Collection of Bacterial Isolates*

Two test isolates (Staphylococcus aureus, Escherichia coli) were collected from the Department of Microbiology.

➢ *Antibacterial Activity of Extract*

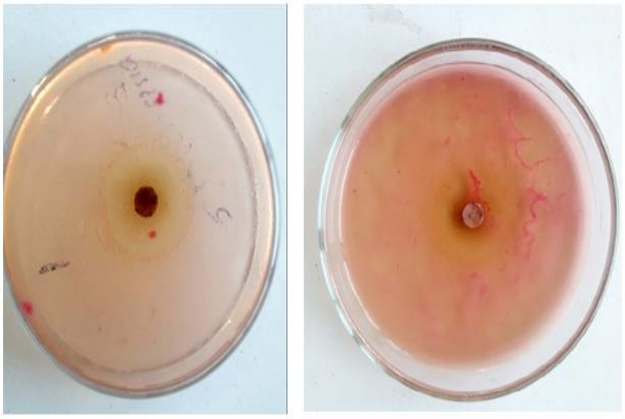
The antibacterial activity of the aqueous and ethanol extracts of Okra seeds were evaluated using agar well diffusion method. Wells were aseptically bored using a sterile cork borer on agar plate already seeded with the test isolates. Okra extract were dispensed into the wells and incubated at 37°C for 24 hrs.

After incubation, the antibacterial activity of the extracts against the test organisms was determined by measuring the clear zones around the wells in diameter. The result obtained are shown in the table give below-

Sample	Test Isolates/ Zone of inhibition	
	Staphylococcus aureus	Escherichia coli
Ethanol extract of okra seeds	++	++
Aqueous extract of okra seeds	+	+

Table 1

Note: (++) indicates zone diameter greater than 20 mm and (+) indicates zone diameter less than 20 mm.



(Staphylococcus aureus) (Escherichia coli)

Fig 2

➢ *Formulation of Sanitizer*

Carbapol is added in distilled water with constant stirring. After uniform mixing, triethanolamine was added with constant stirring to avoid formation of bubbles. The okra seed extract along with glycerine were added in the aqueous phase and finally perfume were mixed with slow stirring to obtain the uniform product. Prepared product was stored in air container.

➢ *Formula*

SR.NO	INGREDIENTS	QUANTITY (FOR30ml)
1	Distilled water	**5ml**
2	Seed extract	**5ml**
3	Glycerin	**0.5ml**
4	Carbapol940	**0.3gm**
5	Triethanolamine	**0.2ml**
6	Vitamin E oil	**0.1ml**
7	Orange oil	**0.1ml**
8	Alcohol70%	**18.8ml**

Table 2

➢ *Evaluation Parameters:*

- *Product Characteristics:*

✓ Colour- Greenish
✓ Fragrance- orange
✓ Consistency- Good, no grittiness

- *pH:*

The pH was determined by using digital pH meter and the pH of herbal hand wash was found 6.5.

- *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.

- *Stability:*

The stability studies were carried out by storing at different temperature conditions like 40°C, 25°C & 37°C for 4 weeks. During the stability studies no change in colour and no phase separation were observed in the formulated hand wash.

- *Irritancy test:*

After rubbing the sanitizer on hands no irritation was observed.

- *Antibacterial Activity of Product:*

The antibacterial activity of the product was evaluated using agar well diffusion method. Wells were aseptically bored using a sterile cork borer on agar plate already seeded with the test isolates. Product were dispensed into the wells and incubated at 37°C for 24 hrs. After incubation, the antibacterial activity of the product against the test organisms was determined by measuring the clear zones around the wells in diameter. The result obtained are shown in the table give below-

Sample	Test Isolates/ Zone of inhibition	
	Staphylococcus aureus	Escherichia coli
Prepared sanitizer	Resistant	Resistant

Table 3

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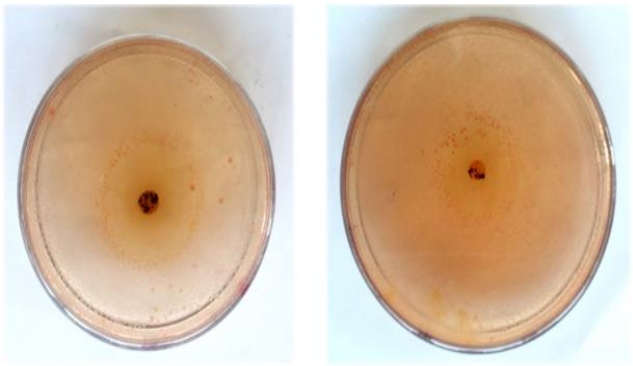

(Staphylococcus aureus) (Escherichia coli)

Fig 3

IV. RESULTS AND DISCUSSION

The potency of the aqueous and ethanol extract of Okra seeds against. S. aureus, E. coli was assessed based on the presence and absence of zone of inhibition measured in diameters (mm) as shown in above table. Plant parts play important role in the search for alternative due to their huge production of organic compounds for medicinal purpose. The aqueous and ethanol extract of the seeds of Okra showed broad range of inhibitory properties against the test bacterial isolates (S. aureus, E. coli). Among the aqueous and ethanol extract of okra samples, ethanol extract showed the highest inhibition against S. aureus and E. coli. The ethanol extract of the Okra seeds were highly effective against most of the test isolate. By using ethanol extract of seeds an effective sanitizer were prepared and evaluated.

V. CONCLUSION

The ability of aqueous and ethanol extracts of A. esculentus seeds to show antibacterial activities could prove Okra seeds as potential natural antibacterial agent. Hand hygiene can also be a problem in between the people. Prevention and control of infectious activities are designed to limit the spread of infection and provide a safe environment for all people, regardless of the setting. In light of the emergence of antibiotic resistant organisms, effective infection control measures, such as hand sanitizing, are essential to prevention. Hand sanitizer gels are used for the purpose of cleaning hands. Its composition is prepared according to delicateness of skin so that it cannot cause any type of irritation. It is concluded that from the result that the gel formulation is good in appearance, homogeneity.

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