

Formulation of Antibacterial Soap by using Okra Seed Extract

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

Keywords: Okra seed extract, soap, anti-bacterial activity, hand hygiene.

1. Introduction

Okra (*Abelmoschus esculentus*) is the only vegetable crop of significance in the Malvaceae family and is very popular in the Indo-Pak subcontinent. In India, it ranks number one in its consumption but its original home is Ethiopia and Sudan, the north-eastern African countries. It is one of the oldest cultivated crops and presently grown in many countries and is widely distributed from Africa to Asia, southern Europe and America. It is a tropical to subtropical crop and is sensitive to frost; low temperature, water logging and drought conditions, and the cultivation from different countries have certain adapted distinguishing characteristics specific to the country to which they belong¹. It is an oligo purpose crop, but it is usually consumed for its green tender fruits as a vegetable in a variety of ways. These fruits are rich in vitamins, calcium, potassium and other mineral matters. The mature okra seed is a good source of oil and protein has been known to have superior nutritional quality. Okra seed oil is rich in unsaturated fatty acids such as linoleic acid, which is essential for human nutrition.

Description:

- Biological name: *Hibiscus esculentus*, *Abelmoschus esculentus*.
- Scientific classification:
- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Malvales
- Family: Malvaceae
- Genus: *Abelmoschus*
- Species: *A.Esculentus*

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 microorganism 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 soap used to decrease infectious agents on the hands.



Fig. 1. Okra

2. Objectives

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

A. Material and method

- **Selection of material:** In the present study, antibacterial effect of okra seed extract is done which

claim to have the potential against various microorganisms.

- **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.

3. 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.

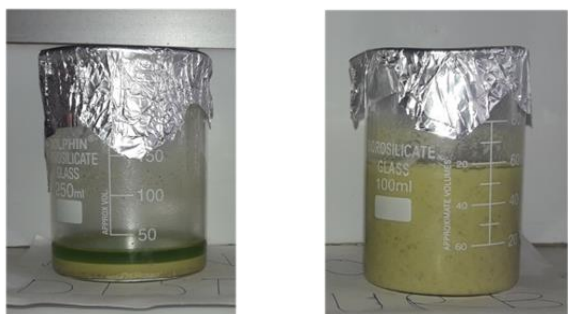


Fig. 2. (Ethanol extract of okra seed) (Aqueous extract of okra seed)

4. Collection of bacterial isolates

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

A. 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 1.



Fig. 3. *Staphylococcus aureus*

Table 1
Test

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

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



Fig. 4. *Escherichia coli*

Table 2
Formula

S. No.	Ingredients	Quantity
1.	Coconut oil	20ml
2.	Palm oil	20ml
3.	Castor oil	20ml
4.	NaOH	20gm
5.	Distilled water	100ml

B. Procedure

20% of NaOH solution is prepared by dissolving 20 gm of NaOH in sufficient water and volume is adjusted to 100 ml with water. All oils are mixed in the beaker and slowly add the NaOH solution. The okra seed extract is added in the mixture. Then mixture is molded in the cube shape.

C. Evaluation parameters

Product Characteristics:

- Colour- Greenish
- Fragrance- orange
- Appearance- Good, no grittiness

pH: The pH was determined by using digital pH meter

Irritancy test: After rubbing the soap on hands no irritation was observed.

5. 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.

6. 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 soap, are essential to prevention. Hand soap is 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.

References

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