

# Antibacterial activity of oil and fruit extract of *Citrullus colocynthis* against different isolated bacterial strains.

Shahad AlMansour<sup>1</sup>, Prarthana M S<sup>2</sup>

<sup>1</sup>Department of Medical Laboratories, College of Applied Medical Sciences, Qassim University, Buraydah ,KSA

<sup>2</sup>Assistant Professor of Microbiology, College of Applied Medical Sciences, Qassim University, Buraydah, KSA

## Introduction

Infectious diseases are the leading cause of death worldwide. The clinical efficacy of many existing antibiotics is being threatened by the emergence of multidrug-resistant pathogens, due to the indiscriminate use of antibiotics and failure of availability of new drugs and vaccines. Traditional medicine is an important source of potentially useful compounds for the development of therapeutic agents (Iwu, 1999). Traditionally, fruit of *Citrullus colocynthis* (C.C) had been used medicinally since ancient times for microbial diseases.

	Kingdom <i>Plantae</i>	Plants
	Subkingdom <i>Tracheobionta</i>	Vascular plants
	Superdivision <i>Spermatophyta</i>	Seed plants
	Division <i>Magnoliophyta</i>	Flowering plants
	Class <i>Magnoliopsida</i>	Dicotyledons
	Subclass <i>Dilleniidae</i>	
	Order <i>Violales</i>	
	Family <i>Cucurbitaceae</i> – Cucumber family	
	Genus <i>Citrullus</i> Schrad. watermelon	
	Species <i>Citrullus colocynthis</i>	

## Background

Many studies done have demonstrated different properties of C.C (Gurudeeban, 2010). **Chemical composition:** tannins, flavonoids, alkaloids and saponin. **Clinical uses:** antioxidant, anti-inflammatory, hypoglycemic, hypolipidemic, anti-alopecia, growth inhibitory activity on breast cancer cell, insecticidal effect, treatment for scorpion envenomation, synthesize of silver nanoparticles and antimicrobial activity. **Side effects:** adverse effects on the reproductive system and fertility, teratogenic effect in early stage of pregnancy and rectorrhagia. **Administration:** it has a strongly irritating and painful effect on mucous membranes due to its cucurbitacin glycoside content. **Toxic dose:** 0.6 to 1 g. **Lethal dose:** starting at 2 g

## Methodology

1-Fruit extracts was obtained by performing steps as shown in figure 1.



Figure 1: Steps involved in fruit extraction.

2-Oil extract: the oil was commercially available, then the extract were diluted to 100 %, 50 % and 25%.

Bacterial isolates: Staphylococcus aureus and Methicillin Resistance Staphylococcus aureus (MRSA), Escherichia coli and Proteus mirabilis.

**Agar well diffusion method:** the tests were performed in duplicates following the steps as shown in figure 2.

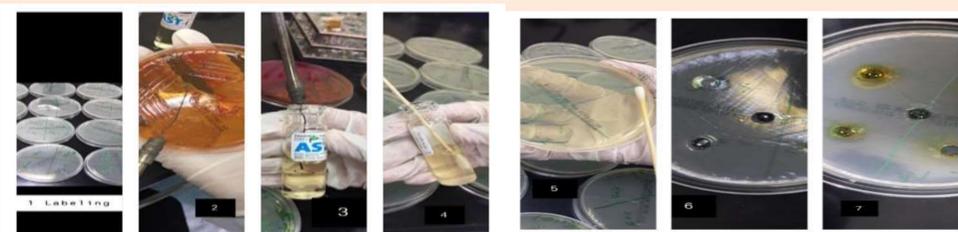
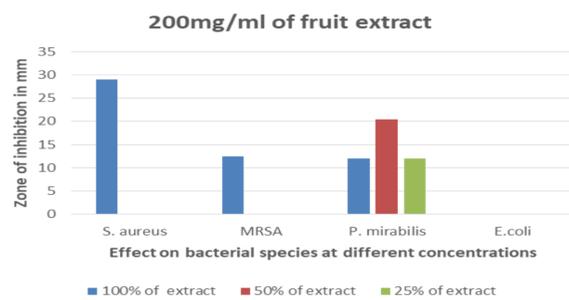


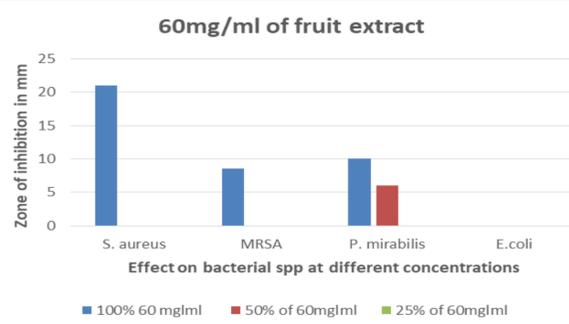
Figure 2: Steps of agar well diffusion method.

## Results



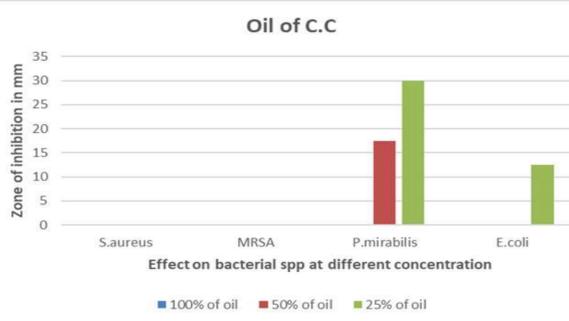
100% of 200mg/ml of the fruit extract exhibited antimicrobial action against *S. aureus*, MRSA and *P. mirabilis*. *P. mirabilis* was sensitive to all the conc of 200mg/ml of the fruit extract. *E. coli* was resistant to all the concentrations of 200mg/ml of the fruit extract as shown in figure 3

Figure 3: Antimicrobial susceptibility of 200mg/ml concentration of fruit extract of CC



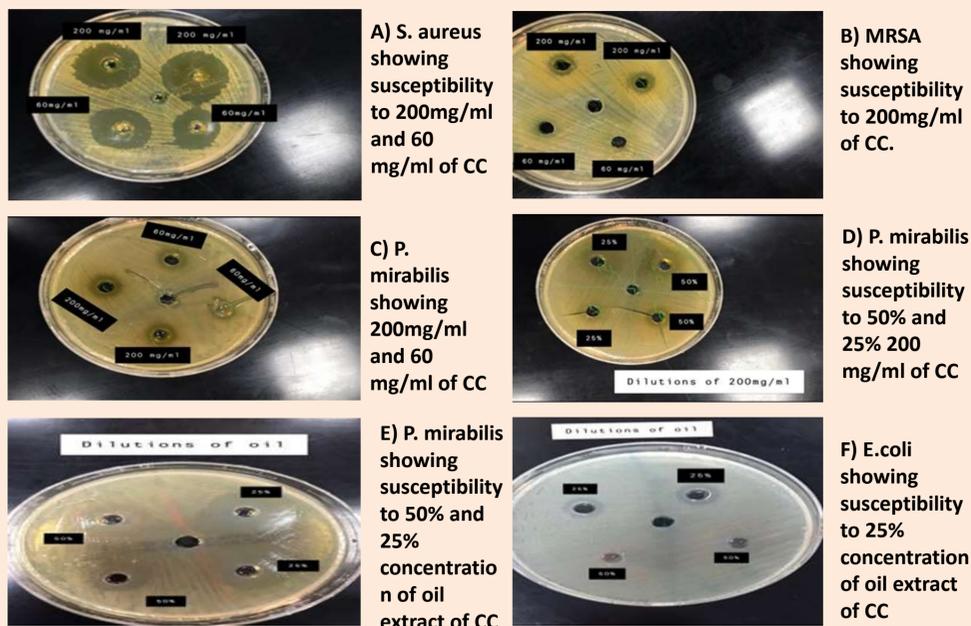
100% of 60mg/ml of the fruit extract exhibited antimicrobial action against *S. aureus*, MRSA and *P. mirabilis*. *P. mirabilis* was also sensitive to 50% concentrations of 60mg/ml of the fruit extract. *E. coli* was resistant to all the concentrations of 200mg/ml of the fruit extract. As shown in figure 4

Figure 4: Antimicrobial susceptibility of 60mg/ml concentration of fruit extract of CC



100% concentration of oil extract of CC had no effect on all the four bacterial isolates. *P. mirabilis* was sensitive to 50% concentrations of oil extract of CC. *E. coli* was sensitive to only 25% concentration of oil extract of CC. As shown in figure 5

Figure 5: Antimicrobial susceptibility of oil extract of CC



## Conclusion

The experimental study of oil and ethanol fruit extract of C.C showed antibacterial activity against *S. aureus*, MRSA, *E. coli* and *P. mirabilis*. This proves that C.C is a promising plant that has antibacterial properties and if used with in the therapeutic range can be potentially useful to treat different bacterial infections.

## References

- Iwu, M.W., Duncan, A.R. and Okunji, C.O., 1999. 50 antimicrobials of plant origin. Perspectives on new crops and new uses. ASHS Press, Alexandria, VA, pp.457-462.
- Gurudeeban, S., Satyavani, K. and Ramanathan, T., 2010. Bitter apple (*Citrullus colocynthis*): An overview of chemical composition and biomedical potentials. Asian Journal of plant sciences, 9(7), p.394