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Evaluation Of Phytochemical And Anti-Bacterial Activity Of Citrillus Lanatus

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ABSTRACT

Citrullus Lanatus is a medicinal plant with therapeutic potential, belongs to the family Cucurbitaceous, also known as, watermelon and is known for its anti-bacterial activity [1]. Recently, many biological activities of Citrullus Lanatus L. seeds have been reported, including traditionally, said to be medicinal because it can relieve inflammation irritation causes increased passing of urine and gives tonic effects and also cucurbit pepo (pumpkin), Citrullus Colocynths (bitter cucumber), among from that I have been taken Citrullus Lanatus seed (watermelon) is one of most effective and potential anti-bacterial activity, particularly in its seed [2]. The result of antibacterial activity indicate that effects of Citrullus Lanatas seed extract were tested on phytochemical, results showed the presence of alkaloids, flavonoids, corticoids, saponins and tannins in the extracts of Citrullus Lanatas. Among that results shows alkaloids and flavonoids were most effective compounds for the antibacterial activity in higher plants. Apart from that saponins show the most responsible and effectively compound for antibacterial activity of Citrullus Lanatas. In this study, two solvents were taken chloroform seed extracts and acetone seed extract from Citrullus Lanatus L. have been tested for Anti-bacterial activity [3]. The antibacterial activity of the extract was examined against Gram-Positive and Gram-Negative bacteria by measuring the zone of inhibition. Results showed acetone extract was increased linearly increasing different concentration of extracts (25 mg/ml, 50 mg/ml, 75 mg/ml, 100 mg/ml) against two pathogenic strains (Escherichia coli, Staphylococcus aureus), by disc diffusion method, as compared with standard drug such as ciprofloxacin and control as acetone, the antibacterial activity of acetone was good. All the two organisms used for screening have the similar sensitivity.

Keywords: Anti-antibacterial activity, Citrullus Lanatus L. seed. Ciprofloxacin, Escherichia coli, Bacillus Subtilis.

INTRODUCTION

Citrullus Lanatus L. seeds have been used as an excellent source of medicine from the outset, which established a foundation of traditional medicine. Such traditional medicinal plants play a vital role in addressing the global health needs of today and their use will increase in the future [4]. Belongs to the family Cucurbitaceous, also known as watermelon and is known for its anti-bacterial activity. In this study, a number of Citrullus Lanatus L seed extracts were tested for Anti-bacterial activity. Recently, many biological activities of Citrullus Lanatus L. seeds have been reported, including traditionally, said to be medicinal because it can relieve inflammation irritation causes increased passing of urine and gives tonic effects and also cucurbit pepo (pumpkin), Citrullus Colocynths (bitter cucumber), among from that I have been taken Citrullus Lanatus seed (watermelon) is one of most effective and potential antimicrobial activity, particularly in its seed [5]. In this study, two solvents were taken chloroform seed extracts and acetone seed extract from Citrullus Lanatus L. have been

tested for Anti-bacterial activity. The seed extracts were tested against clinical isolates including, Escherichia coli, Bacillus Subtilis was tested on agar disc diffusion method determined by the anti-bacterial activity. It was observed by the acetone extracts had the highest anti-bacterial effect on Bacillus Subtilis, followed by hot acetone extract while cold chloroform extract showed no antibacterial activity [6]. Results of this study reveal that kind of solvent employed as well as the conditions for extraction influenced the efficiency of the extract against special test organisms.

Fig 1: Citrullus Lanatus (watermelon)

Fig 2: Escherichia coli are gram-negative bacteria.

Escherichia coli, commonly abbreviated E. coli, it is a gram-negative rod-shaped bacteria that is commonly found in the lower intestine of warm blooded organisms (endotherm). Most E. coli strains are harmless and are occasionally responsible for product recalls due to food contamination [7]. The harmless strains are part of normal flora of the gut, and can benefit their hosts by producing vitamin K and by preventing the establishment of pathogenic bacteria within the intestine. E. coli and related bacteria constitute about 0.1% of gut flora, and fecal-oral transmission is the major route through which pathogenic strains of the bacteria cause disease cells are able to survive outside the body for a limited time, environmental samples for fecal contamination[8]. There is, however, a growing body of research that has examined environmentally persistent E. coli, which can survive for extended periods outside of the host [9].

Bacillus subtilis is a Gram-positive bacteria bacterium, rod-shaped and catalase positive. It was originally named Vibrio subtilis by Christian Gottfried Ehrenberg, and renamed Bacillus subtilis by Ferdinand Cohn in 1872 (subtilis being the Latin for "fine"). B. subtilis cells are typically rod-shaped, and are about 4-10 micrometers (um) long and 0.25-1.0 um in diameter, with a cell volume of about 4.6 fl at stationary phase [10]. As with other members of genus Bacillus, it can form an endospore, to survive extreme environmental conditions of temperature and desiccation. B. subtilis is a facultative anaerobe condition [11]. B. subtilis is heavily flagellated, which gives it the ability to move quickly in liquids. B. subtilis has proven highly amenable to genetic manipulation, and has become widely adopted as a model organism for laboratory studies, especially for sporulation, which is simplified example of cellular differentiation [12]. The number of spores found in human gut was too high to be attributed solely to consumption through food contamination. B. subtilis appears in normal honey bee gut flora in some bee habitats.

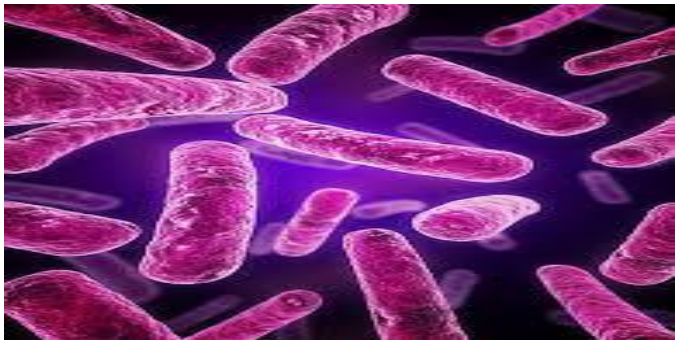

Fig 3: Bacillus subtilis is a Gram-positive bacterium

MATERIALS AND METHODS

Materials

Citrullus Lanatus (watermelon) seeds were procured from local market, acetone and chloroform was procured from S.D. Fine chemicals, Mumbai. Ciproflaxin drug was obtained as a gift sample from Aurobindo pharma Ltd., Hyderabad. Clinical isolates of Staphylococcus sp, Escherichia coli, were obtained from Acharya Nagarjuna University, Guntur. All the other chemicals were procured of Victoria College of pharmacy nallapadu.

Methods

Citrullus Lanatus (watermelon) seeds of good quality were purchased from local market and eight watermelon fruits were purchased were cleaned, and then cut and open to obtain the seeds washed and air dried for 7 days, then pulverized using mortar and pestle under aseptic conditions and ground to powder using a blender core powder. Powdered seed materials were then weighed (175 gm) and kept in air tight containers until further usage.

Extraction of seeds

Chloroform extract

10 g of seed powder were weighed and transferred into soxhlet apparatus and the seed powder was extracted with chloroform at 35°c for 3-4 cycles. The extract was collected and the chloroform was evaporated after extraction by using rotary evaporator connected to a vacuum pump. The final extract in semi solid form was dried by placing in desiccators. A rotary evaporator, yielding the extracted compound and their percentage yield is calculated respectively and used for further extracted crude drug phytochemical evaluation studies.

Acetone extract

10 g of seed powder were weighed and transferred to soxhlet apparatus and the seed powder was extracted with acetone at 35°c for 3-4 cycles. The extract was collected and the acetone was evaporated after extraction by using rotary evaporator connected to a vacuum pump. The final extract in semi solid form was dried by placing in desiccators. A rotary evaporator, yielding the extracted compound and their percentage yield is calculated respectively and used for further extracted crude drug phytochemical evaluation studies.

PHYTOCHEMICAL SCREENING

Phytochemical analysis of various solvents extracts of Citrullus Lanatas.

S.NO	TEST	ACETONE	CHLOROFORM
1.	alkaloida	+++	++
2.	corticoids	+	+
3.	tannins	_	+
4.	flavonoids	+++	++
5.	saponins	++++	_

The result of antibacterial activity indicate that effects of Citrullus Lanatas seed extract were tested on phytochemical, results showed the presence of alkaloids, flavonoids, corticoids, saponins and tannins in the extracts of Citrullus Lanatas. Among that result showed alkaloids and flavonoids were most effective compounds for the antibacterial activity in higher plants. Apart from that saponins show the most effectively compound for antibacterial activity of Citrullus Lanatas.

Anti-bacterial activity

The antibacterial activity of Citrullus Lanatus was carried out against the Staphylococcus aureus and Escherichia coli. The antibacterial activity of the compounds can be assessed by disc diffusion method.

Preparation of Paper Discs

Discs of 5-6 mm in diameter were punched from No.1 whatman filter paper with sterile cork borer of same size. These discs were sterilized by heating at 140ºc, for 60 min.

Fig 4: Whatman filter paper

Preparation of Nutrient Agar Media

Nutrient agar, which served as the basal medium, was prepared by dissolving.

1. Peptone (Bacteriological) - 20 gm
2. Meat extract (Bacteriological) - 8.5 gm
3. Agar - 25 gm
4. Distilled Water up to - 500 ml

Nutrient agar medium was prepared by dissolving all these ingredients in water and that is subjected sterilization using autoclave at 15 lbs pressure for 20 mins and adjusted the pH to 6.8.

Fig 5: Nutrient agar medium preparation

Disc diffusion method

The antibacterial activity of the compounds can be assessed by disc diffusion method. The sterilized media (about 15-20 ml) was transferred to sterilized Petri dishes, which are properly labeled previously and then allowed to solidify after this inoculation of microorganisms was done by using a cotton swab. Then the disc that previously prepared were carefully kept on the solidified medium and these Petri dishes kept as such for 1 hour at room temperature and then kept for incubation at 37ºc for 24 hrs in an incubator. The zone of inhibition was measured in millimeters (mm), after 24 hrs.

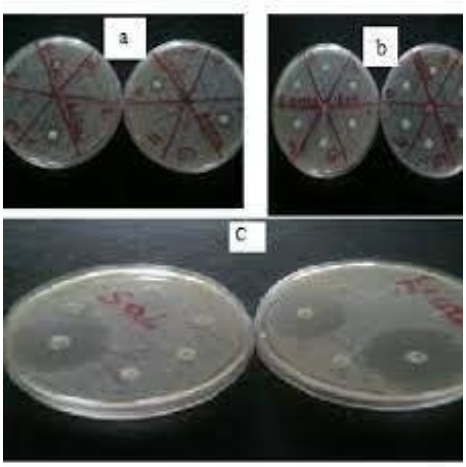

Fig 6: Antibacterial activity of watermelono Ciprofloxacin against Bacillus subtilis

Fig 7: Antibacterial activity of Seed sagainst Bacillus subtilis

Fig 8: Antibacterial activity of Watermelon Ciprofloxacin against Bacillus subtilis

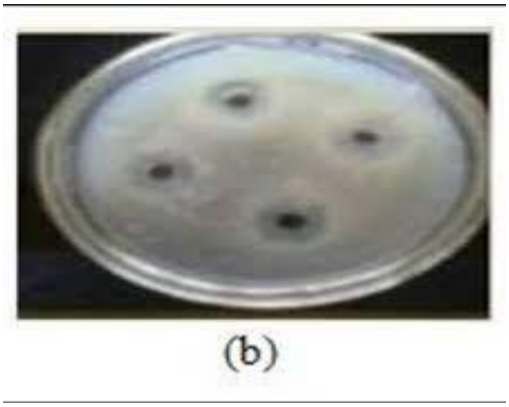

Fig 9: Antibacterial activity of Seeds against Bacillus subtilis

RESULTS AND DISCUSSION

Preliminary phytochemical results showed the presence of Alkaloids, Flavonoids, Corticoids, Saponins and Tannins in the extracts of Citrullus Lanatus. Available reports tend to show that alkaloids and flavonoids are the responsible compounds for the antibacterial activity in higher plants. Saponins are responsible for antibacterial activity of Citrullus Lanatus. The antibacterial activity of the extract was examined against Gram-Positive and Gram-Negative bacteria by measuring the zone of inhibition. The antibacterial activity of chloroform extract of seeds of Citrullus Lanatus was studied in different concentrations (25 mg/ml, 50 mg/ml, 75 mg/ml, 100 mg/ml) against two pathogenic strains (Escherichia coli, Staphylococcus aureus), by disc diffusion method. The result of antibacterial activity was present in above figures. The antibacterial activity of extract increased linearly with increase in concentration of extracts (mg/ml). As compared with standard drug such as Ciprofloxacin and control as acetone, the antibacterial activity of acetone extract was good. All the two organisms used for screening have the similar sensitivity. The inhibitory effect of Citrullus Lanatus seed acetone extract showed at 25, 50, 75, 100 mg/ml(15, 17, 18, 20 mm) for Escherichia coli and (14, 16, 17, 21 mm) for Staphylococcus aureus, for bacterial strain respectively.

CONCLUSION

The result of antibacterial activity indicate that effects of Citrullus Lanatas seed extract were tested on phytochemical, results showed the presence of alkaloids, flavonoids, corticoids, saponins and tannins in the extracts of Citrullus Lanatas. Among that results shows alkaloids and flavonoids were most effective compounds for the antibacterial activity in higher plants. Apart from that saponins show the most effectively compound for antibacterial activity of Citrullus Lanatas. The antibacterial activity of the extract was examined against Gram-Positive and Gram-Negative bacteria by measuring the zone of inhibition. Results showed acetone extract was increased linearly increasing different concentration of extracts (25 mg/ml, 50 mg/ml, 75 mg/ml, 100 mg/ml) against two pathogenic strains (Escherichia coli, Staphylococcus aureus), by disc diffusion method, as compared with standard drug such as ciprofloxacin and control as acetone, the antibacterial activity of acetone was good. All the two organisms used for screening have the similar sensitivity.

Data availability

No data were used to support the finding of this study.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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