

# Antimicrobial Activity of Different Types of Vine gar

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## Abstract :

In this search ,the antimicrobial activity of vinegar of date, apple, grape and garlic were evaluted against gram positive bacteria (*Staphylococcus.aureus*) and gram negative bactria (*Pseudomonas aeruginosa*) comparing with amoxyline .The results indicated that the vinegar of four plants had greatest antimicrobial activity comparing with amoxyline as antibiotic.

## Introduction:

Vinegar is a liquid fit for human consumption ,produced from a suitable raw material of agricultural origin ,containing starch ,sugars,or starch and sugars by the process of double fermentation ,alcoholic and acetous ,and contains a specified amount of acetic acid.Vinegar is produced by a tow stage fermentation process, being the first one the conversion of fermentable sugars to ethanol by yeasts , and the second the oxidation of ethanol by bacteria. Most of plants are used world wide to address avariety of health problems ,approximately 50% of current pharmacetucals and drugs derived from natural sources or semisynthetic derivatives of natural products from plants.Plants are rich in awide variety of phytochemical metabolites which are divided into two groups : primary and secondary metabolite ,primary metabolite such as proteins ,amino acids,sugars ,while secondary metabolite consist of glycosides ,steroids ,phenols ,saponins, terpenes , alkaloids<sup>(1-9)</sup>. Aims to solve antibiotic resistant incident problem among pathogenic bacteria is to develop new drug from natural source such as plant .

## Materials & Methods :

### \_Preparation of plants vinegar:

Date (phoenixd dactylifera), apple(pyrus malus), grap(vitis vinifera.L.) and garlic (Allium sativum) were collected from various markets washed with clean sterile water . To prepare vinegar of respective plants, 200gm each of respective four plants were put in container with 700ml of distilled water ,then covered and left them for 40 day. After that ,filtered by using a sterile muslin cloth.To determine minimum inhibitory concentration(MIC) for each vinegar of four plants were ranged between (5-10)mg/ml by dilution and preparation 0.1mg/ml standard antibiotic amoxyline as positive standard<sup>(4)</sup> .

### \_Antibacterial activity :

Anti bacterial activity of the four types of vinegar were determined against gram positive bacteria (*Staphylococcus aureus* )and gram nagitive bacteria (*Pseudomonas aeruginosa*) (from Teaching Hospital in Basra), using the paper disc agar diffusion 0.1 ml of the bacterial suspensions were seeded on agar ,the four types of vinegar were applied to apaper discs ,after that the discs were dried and placed at the plates ,0.1 mg/ml of antibiotic amoxyline as positive

standard .This test was repeated in duplicates .The positive results or sensitivity were established by the presence of clear zone of inhibition around active extracts which were measured with a meter rule and diameters were recorded based on (mm) <sup>(4)</sup>.

#### Results and Discussion:

The objective of antimicrobial activity was analyze past ,present and future of medicinal plants to suggest as fundamental the research on plant during the past decade ,this bacterium has developed resistance to many commonly sued antibiotics <sup>(4,10)</sup>The present study carried out on the plants vinegar revealed the presence of antibacterial activity which is due to presence of medicinally active constituents such as alkaloids, tannins ,flavonoids ,glycosides ,phenols ,which were present in all plants<sup>(1,12)</sup>Table (1) showed the zone of inhibition of four vinegar types in this study ranged (from 28 to 11) mm. From results, we noted that the garlic vinegar has higher antibacterial activity against *S.aureus* and *P.aeruginosa* is due to the presence of carbonyl group (C=O )with one or more of phenol group resulting in elevating the compounds negative charge. Consequently,these compounds become more effective in precipitating proteins on bacteria cell walls.These phenol groups tend to form hydrogen bonds with cell wall protein and hence ,destroying the cell membranes<sup>(13-15)</sup> ,these compounds had abroad antibacterial activity .These results showed that there are difference in the antibacterial effect of plant groups ,due to phytochemical components differences ,for this reason , all types of vinegar in this study especially garlic can be used as antimicrobial agents in development of new drugs for the treatment of infectious disease.

Table(1) :Antibacterial activity of various types of vinegar {diameter of zone (mm)} .

Plants vinegar *	diameter of zone(mm)	
	<i>G+</i> : <i>Staphylococcus. aureus</i>	<i>G-</i> : <i>Pseudomonas. aeruginosa</i>
Garlic	28	22
Date	26	20
Apple	21	18
Grape	14	11
Amoxyline**	32	25

\*Minimum Inhibitory concentration (MIC)of plants vinegar (5mg/ml) .  
 \*\* Amoxyline (0.1mg/ml) .

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## الفعالية البيولوجية لأنواع مختلفة من الخل

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### الخلاصة:

تم في هذا البحث دراسة الفعالية ضد المايكروبية لخل كل من التمر، التفاح، العنب والثوم باستخدام طريقة انتشار الأقراص الورقية على نوعين من البكتريا الموجبة لصبغة كرام والبيكتريا السالبة لصبغة كرام (*Staphylococcus.aureus*) ثم مقارنة فعاليتها مع تأثير المضاد الحيوي الأموكسيلين (*Pseudomonas aeruginosa*) حيث اشارت النتائج بأن خل كل من النباتات الاربع قيد الدراسة تمتلك فعالية بايولوجية عالية ضد نوعين من البكتريا المدروسة مقارنة مع الأموكسيلين.