الخلاصة

إن نبات الكُبير يمتلك المركبات الفعالة التي تجعله يستخدم كمضاد لنمو الأحياء المجهرية. تم دراسة فعالية المستخلص الميثانولي والهكساني لازهار نبات الكُبير وتتراكيز تتراوح بين 125-1000mg/ml باستخدام طريقة الانتشار بالحفر ضد الأنواع البكتيرية التالية: Klebsiella sp., Pseudomonas aeruginosa, Eseherichia coli, Proteus sp., Enterococcus sp., Lactobacillus sp., Staphylococcus aureus و Streptococcus sp.

أظهرت النتائج أن المستخلص الميثانولي كان الأكثر فعالية من المستخلص الهكساني لمعظم الأنواع البكتيرية المستخدمة في الاختبار. حيث حددت فعالية المستخلص بقياس قطر منطقة التثبيط حيث ابتدت كل من مناطق تثبيط Eseherichia coli, Lactobacillus sp., Proteus sp, و Staphylococcus aureus Klebsiella sp., Pseudomonas aeruginosa, عند التركيز 125-1000mg./ml فاعلت مناطق تثبيط عند Entero coccus sp., و Proteus sp. و Staphylococcus aureus, Lactobacillus sp. Klebsiella sp. و Eseherichia coli عن التركيز 1000mg/ml بينما ابتدت Pseudomonas و Entero coccus sp. و aeruginosa 1000mg./ml في حين لم تظهر مناطق تثبيط لنمو Proteus sp. و Entero coccus sp. و aeruginosa. و Eseherichia coli

وكل من نتائج البحث أن المستخلصات المستخدمة لها دور في مجال الصناعات الدوائية وكمواد حافظة للاغذية.
ABSTRACT

*Cappris spinosa* has active compounds make it has antibacterial properties. Antibacterial effects of different concentrations ranging from (125-1000mg/ml) of hexane and methanol extracts of *capparis spinosa* flowers was determined by using agar well diffusion method in clinical strains:

*Klebsiella sp.*, *Pseudomonas aeruginosa*, *Eseherichia coli*, *Proteus sp.*, *Entero coccus sp.*, *Lactobacillus sp.*, *Staphylococcus aureus* and *Streptococcus sp.*

Methanol extract of *capparis spinosa* flowers was the most active than hexane extract. The activity of *capparis spinosa* determined by measuring inhibition zone as following: *Lactobacillus sp.*, *Escherichia coli*, *Streptococcus sp.* and *Staphylococcus aureus* showed inhibition zone at concentration of 125 -1000mg/ml. *Klebsiella sp.*, *Spedomonas arruginosa* and *Entero coccus sp.* Showed inhibition zone of 500-1000mg/ml. it was no inhibition zone for *Proteus sp.*

Hexane extract of *Capparis spirosa* flowers was less active than methanol extract against tested bacteria.

*Lactobacillus sp.*, *Staphylococcus aureus* and *Streptococcus sp.* Showed inhibition zone at concentrations 150- 1000 mg/ ml while *Eseherichia coli, aureas* and *Klebsiella sp.* Showed sensitivity at concentration 1000mg/ml. There was no inhibition zone for *Pseudomonas arruginosa, Enterococcus sp.* And *Proteus* these results support the notion that plant extracts may have a role as pharamaceutical and preservatives.

INTRODUCTION

One way to prevent antibiotic resistance of pathogenic species is by using new compounds that are not based on existing synthetic agents.

Medicinal plants might represent an alternative treatment in none sever cases of infection diseases.

They can be possible source for new potent antibiotics to which pathogenic strains are not resistant(1).

In Many part of the world medicinal plants are used for antibacterial, antifungal and antiviral. They contain numerous biologically active compounds, many of which have been shown to have antibacterial
properties. The first recorded use of *Cappairs spinosa* was for medicinal purposes in 2000 Bc by the Sumerians, the ancient Greeks and Romans also used the plant for these purposes.

The frouits and the root of the plant have been used in gout and also as diuretics, a stringents and tonics in traditional Iranian medicine. (2).

 Also *Capparis spinosa* effective herbal drug for the treatment of rheumatism. (3).

Even its flower buds have some medical uses and are taken to improve liver functions or as a kidney disinfectant. Moreover, it was reported that the plant possesses significant anti – inflammatory activity against carrageenan induced edema in rats, (4) and the aqueas extract of *Capparis spinosa* exhibited anti- hyperglycemic(5) and hypolipidemic activities(6).

Other activities include antiviral, immunomodulatroy(7), anti-allergic, antihistaminic(8), anti fungal, and anti leishmania(9). Furthermore, whole extracts of the floral buttons, applied topically in cosmetic bases, are reported to possess stimulant, bioactiving, hydrating properties on dry, aged, and undernourished skin(10).

Gram positive and Gram – negative bacteria were selected as the test microorganisms based on their clinical, pharmaceutical and bromatogical importance in cases of infections and contamination of food.

The aim of the present study was to evaluate the effect of methanol and hexane extracts of the flowers against various pathogenic bacteria.

**MATERIALS AND METHODS**

*Capparis spinosa* flowers:

The flowers were collected from AL –Anbar desert in (May 2010). And was identified by Dr. Ali Al-Mosawy, Department of Biology, College of Science, Baghdad University.

**BACTERIAL STRAINS**

All bacterial strains used in the study are clinical strains, and kindly provided by microbiology labrotary in pharmacy college at (October to December /2010). They are *Klebsiella sp., Pseudomonas aeruginosa, Eseherichia coli, Proteus sp., Enterococcus sp., Lactobacillus sp., Staphylococcus aureus and Streptococcus sp.*
The Study of Antibacterial Activity of Capparis Spinosa Flowers

Basma

PREPARATION OF EXTRACTION:
For extraction of capparis spinosa flowers, methanol and hexane were used as solvents, thirty grams of the flowers were extracted with 300ml of methanol by using soxhlet apparatus for 10hr.(11) Then the extracts were filtered by using whatman No. 1 filter paper and the solvent was evaporated using rotary distillation apparatus.

In order to obtain a completing dry extract, the resultant extracts were transferred to glass dishes and were left in 40°C oven for 24hrs. Then they were left at 4°C until assessments of their antibacterial activities.

For extraction of capparis spinosa flowers with hexane, the same procedure was followed by using the same volume of hexane.

ANTIBACTERIAL ACTIVITY:
The residual extracts were dissolved in their extracting solvents to yield the final concentration: 1000, 500, 250 and 125 mg./ml.

The agar were diffusion method was used to determine antibacterial activity of extracts (12). The culture medium was calculated with one of tested bacteria suspended in Mueller –Hinton agar.

Six millimeter diameter wells were punched in to the agar filled with 0.1 ml of each extract. Solvents were used as negative control while antibiotic of streptomycin at the same concentration were used as positive control. By measuring the inhabitation zone diameter observed.

RESULTS AND DISCUSSION
The results showed that the methanol and hexan extracts of Capparis spinosa flowers had the antibacterial activity. The different concentration of hexane extract of Cappairs spinose flowers (table 1) produced inhibition zones against tested bacteria; Streptococcus sp., Lactobocillus sp. And Staphylococcus aureus ranging from 1000-500mg/ml., they are produced the largest inhibition zone, there was no inhibition zone for Pseudomonas aeruginosa proteus, and Entero coccus sp. .Escherichia coli and Klebsiella sp. Produce inhibition zone at concentration of 1000mg/ml

Escherichia coli, Lactobocillus sp., Staphylococcus aureus and Streptococcus sp. showed the highest sensitivity to methanol extract of
*Capparis spinosa* flowers (table 2), they were sensitive to concentration ranging from 1000-125gm./ml. While *Klebsiella sp.*, *Pseudomonas aeruginosa* and *Enterococcus sp.* were sensitive to concentration of 1000-500mg./ml. *Proteus sp.* did not showed any inhibition zone to all concentration of this extract.

Hexane extract of *Capparis spinosa* was less effective than methanol extract effective against tested bacteria. Solvents (negative controls) used for preparation different concentrations showed no activity against any tested bacteria. streptomycin (positive controls) at concentration of 1000mg/ml, showed inhibition zone ranging from 40-23 mm against all tested bacteria (table -3).

**Table 1: Antibacterial activities of hexane extract of *Capparis spinosa* flowers**

<table>
<thead>
<tr>
<th>Tested bacteria</th>
<th>Inhibition zone diameter (mm) concentrations of hexan extract of <em>Capparis spinosa (mg/ml)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000</td>
</tr>
<tr>
<td><em>Klebsiella sp.</em></td>
<td>7</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>-</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>7</td>
</tr>
<tr>
<td><em>Proteus sp.</em></td>
<td>-</td>
</tr>
<tr>
<td><em>Enterococcus sp.</em></td>
<td>-</td>
</tr>
<tr>
<td><em>Lactobacillus sp.</em></td>
<td>10</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>7</td>
</tr>
<tr>
<td><em>Streptococcus sp.</em></td>
<td>13</td>
</tr>
</tbody>
</table>

**Table 2: Antibacterial activities of methanol extract of *Capparis spinosa* flowers**

<table>
<thead>
<tr>
<th>Tested bacteria</th>
<th>Inhibition zone diameter (mm) concentrations of methanol extract of <em>Capparis spinosa (mg/ml)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000</td>
</tr>
<tr>
<td><em>Klebsiella sp.</em></td>
<td>8</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>13</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>22</td>
</tr>
</tbody>
</table>
The present study was designed to obtain preliminary information on the antibacterial activity of \textit{Capparis Spinosa} flowers on pathogenic bacteria.

The agar well diffusion method was preferred to be used in this study. The results showed a remarkable antibacterial activity of the methanol and hexane extracts of this plant the methanolic extracts had the best antibacterial activity than hexan extracts, the relatively high potency of the methanolic extracts may be attributed to the dissolving power of alcohol over water (13).

In literature it has been indicated that the antibacterial activity is due to different chemical agents in the extract, including alkaloids, polyphenols, flavanoids, aliphatic glycosinolates(14), and phenolic compounds derivatives play an important role in its bioactivities. (The methanolic extract of \textit{Capparis spinosa} has an antioxidant effect (15, 16).
The antibacterial activity of Capparis spinosa flowers due to flavanoids, phenolic acids and glycosides (14), (17).

The results showed gram – negative bacteria were shown to be more resistant than gram positive bacteria.

The resistance of gram negative bacteria towards antibacterial substances is related to lipopolysaccharides in their outer membrane (18).

The activity is referred to the presence of glycosides which can get hydrolyzed to release phenolics which are toxic to microbial pathogens (19), or may be due to impairment of variety enzyme systems including those involved in energy production and structural component synthesis (20, 21).

Finally, the results of this study revealed that the flowers of Capparis spinosa possess some antibacterial properties as antibiotics principles, the diameters of inhibition zone of the antibacterial agents i.e. Capparis spinosa and streptomyein were different, according to the kinds, concentrations and purity, and this results obtained support the fact that more needs to be done on the purification, identification and quantification of the active of extracts components with the view of their used for in vivo studies.

REFERENCES


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