Full Length Research Paper

Phytochemical screening and antibacterial activity of the crude extract of *Cydonia Oblonga* seeds.

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*Cydonia Oblonga seeds* were assessed for Phytochemicals. The results showed that the extract of the seeds possessed tannins, glycosides and phenolic compounds. The antibacterial activity of the seeds extract was assayed against *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Klebsiella pneumoniae*, *Escherichia coli* and *Moraxella* using the agar well diffusion method. The extract exhibited antibacterial activity, *Staphylococcus aureus* was the most susceptible to the plant seeds extract while *Escherichia coli* and *Moraxella* were the most resistant. In conclusion, *Cydonia Oblonga* seeds had potential antibacterial activity against gram-positive bacteria more than gram-negative bacteria.

**Keywords:** *Cydonia Oblonga*, seeds extract, phytochemicals, antibacterial.

**INTRODUCTION**

Usage of plants in curing illnesses has deep roots in Man’s history (Grabley and Thiericke, 1999). Many studies have been previously carried out for *cydonia oblonga* seeds. Some on its medicinal usage, such as in the treatment of gut (diarrhea, intestinal colic and constipation) and airways (cough, sore throat, bronchitis and asthma) disorders (Nadkarni,1976,Duke et al., 2002, Prajapati et al., 2006and Janbaz et al. 2013), as a drop for conjunctivitis (Siddiqui et al. 2002) and healing of skin lesions (Hemmati et al. 2010); others on its antibacterial activity (as a whole fruit) (Bonjar, 2004 and Fattouch et al. 2007).

Different chemical studies of detection and isolation of phytochemicals or active principles in *cydonia oblonga* seeds were reported (Branca et al., 2005, Magalhaes et al., 2009, and Carvalho et al., 2010).

To our best knowledge and literary survey, there is no report available on antibacterial activity of *cydonia oblonga* seeds’ extract against the selected bacteria used in this research.

The aim of this research was to evaluate the phytochemical and antibacterial activities of the crude extract of *cydonia oblonga* seeds.

**MATERIALS AND METHODS**

- **Plant collection**

The seeds were collected from herbal drugs shop in Baghdad-Iraq.
Preparation of plant extracts

For extraction of *cydonia oblonga*, ethanol 99.9% was used as solvent, thirty grams of the seed powders were extracted with 300ml of ethanol by using soxhlet apparatus for 10hr (Lin et al., 1999). Then the extract was filtered by using what man No.1 filter paper and the solvent was evaporated using rotary distillation apparatus. In order to obtain a completely dry extract, the resultant extract was transferred to beaker and was left in 50°C oven for 24hrs. The extract divided to parts some uses to asses phytochemical compounds and other left at 4°C until assessments of their antibacterial activities.

Phytochemical analysis of extract

The methods described by Harborne (1978) with slight modifications were used to test for the presence of the active ingredients in the test sample.

**Test for phenolic compounds**

The crude extract (5g) was dissolved in distilled water and tested with gelatine solution (1%), gelatine-salt reagent (1% + 10% NaCl) and salt solution (10% NaCl). The presence of phenolic compounds was detected by the appearance of white precipitate with gelatine solution or with gelatine-salt reagent.

**Test for tannins**

Powdered seeds (1.0 g) was weighed into a beaker and 10 ml of distilled water added. The mixture was boiled for five minutes. Two drops of 5%FeCl3 were then added. Production of greenish precipitate indicated the presence of tannins.

**Test for alkaloids**

The extract of the seeds (0.5 g) was stirred with 5 ml of 1% HCl on a steam bath. The solution obtained was filtered and 1 ml of the filtrate was treated separately with Mayer’s reagent and Dragendorff’s reagent. The two solutions were mixed and made up to 100 ml with distilled water. Clearance was regarded as evidence for the absence of alkaloids in the extract.

**Test for glycosides**

Coarsely powdered *cydonia oblonga* (1 g) was added into two separate beakers. To one of the beakers was added 5 ml of dilute sulphuric acid while 5 ml of water was added to the other beaker. The two beakers were heated for 3–5 min and the contents filtered into labeled test tubes. The filtrate was made alkaline with 5% sodium hydroxide and heated with Fehling’s solution for 3 min. The presence of reddish precipitate in the acid filtrate and the absence of such precipitate in the aqueous filtrate were regarded as positive for glycosides.

**Bacterial Strains:**

All bacterial strains used in the study are clinical strains, and kindly provided by Al-Yarmouk Teaching Laboratories, Ministry of Health at May 2013. They are *Staphylococcus aureus* (G+), *Staphylococcus epidermids* (G+), *Klebsiella pneumonia* (G-),*Escherichia coli* (G-) and *Moraxella* (G-).

**Antibacterial activity:**

The ethanolic extract dissolved in dimethylsulfoxide (DMSO) in order to obtain the final concentrations: 500, 250, and 125 mg/ml. The agar well diffusion method was used to determine antibacterial activity of extract (Anesini, and Perez, 1993). Six millimeter diameter wells were punched in to the agar and filled with 0.1ml of each extract. Solvents were used as negative control. The antibacterial activity was evaluated by measuring the inhibition zone diameter observed.

**RESULTS AND DISCUSSION**

Phytochemical screening of the *cydonia oblonga* seeds extract revealed that the seeds contain tannins, glycosides and phenolic compounds while negative result was recorded for alkaloids which confirm the absence of this active principle (Table 1).

The in vitro antibacterial activity of seeds extract against the tested bacteria was assessed by the presence or absence of inhibition zone diameters.

The active principles identified in this study exhibited antibacterial activity against *s. aureus* at all concentrations and the sensitivity increases directly with increasing the concentration, *s. epidermids* was sensitive at 500 mg/ml and *k. pneumonia* was sensitive at 250mg/ml. *E. coli* and *Moraxella* show no sensitivities at all concentrations which mean they were highly resistant to this ethanolic extract (Table 2).

The results showed that gram-negative bacteria were more resistant than gram positive bacteria. The resistance of gram negative bacteria towards antibacterial substances is may be related to lipopolysaccharides in their outer membrane (Gao et al., 1999).

Tannins have been reported to prevent the development of microorganisms by precipitating microbial protein and
Table 1. Phytochemical analysis of *cydonia oblonga* seeds extract

<table>
<thead>
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<th>Active principle</th>
<th>Ethanolic extract</th>
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<tbody>
<tr>
<td>Tannins</td>
<td>+</td>
</tr>
<tr>
<td>Alkaloids</td>
<td>-</td>
</tr>
<tr>
<td>Glycosides</td>
<td>+</td>
</tr>
<tr>
<td>Phenolic compounds</td>
<td>+</td>
</tr>
</tbody>
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+ Present  
- Absent

Table 2. Antibacterial activities of *cydonia oblonga* seeds extract.

<table>
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<th>Concentration (mg/ml)</th>
<th>Mean diameter of zone of inhibition mm</th>
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<tbody>
<tr>
<td></td>
<td>s. aureus</td>
</tr>
<tr>
<td>DMSO control</td>
<td>0</td>
</tr>
<tr>
<td>125</td>
<td>8</td>
</tr>
<tr>
<td>250</td>
<td>10</td>
</tr>
<tr>
<td>500</td>
<td>12</td>
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making nutritional protein unavailable for them (Fluck, 1973).

It therefore suggests that the seeds extract used in the present study may have a selected antibacterial activity. The large size of the zones of inhibition indicated the potency of the active principles of the seeds. It was recorded that an increase in the concentration of the extract yielded higher activity as shown by the diameter of zone of inhibition (Table 2). The fact that organisms may need higher concentrations of extracts to inhibit or kill them may be due to their cell wall components.

Finally, the results of this study revealed that the seeds of *cydonia oblonga* extract possess some antibacterial properties, the diameters of inhibition zone of the antibacterial agent was different according to the 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 use for *in vivo* studies.

**CONCLUSION**

Ethanolic extract of *cydonia oblonga* seeds produced antibacterial activity against *Staphylococcus aureus*, *Staphylococcus epidermids* and *Escherichia coli*. The extract contains the phytochemicals tannins, glycosides and flavonoids. This study observes that *cydonia oblonga* seeds have antibacterial properties on gram-positive bacteria more than on gram-negative bacteria.

**REFERENCES**


