Efficacy of Syrian Propolis Against Several Bacterial Strains

Rim M. Harfouch*, Rawan Fead¹, Lubana Hammoud¹ and Nora Harfouch²

¹Department of Biochemistry and Microbiology, Faculty of Pharmacy, Al Andalus University, Tartous, Syria
²Department of Dermatology, Faculty of Medicine, Tishreen University, Latakia, Syria

*Corresponding author
Rim M. Harfouch, Department of Biochemistry and Microbiology, Faculty of Pharmacy, Al Andalus University, Tartous, Syria. E-mail: rimharfouch@au.edu.sy

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Introduction
Propolis is a natural resin material that is rich of effective compounds like flavanones such as Naringenin, pinobanksin, pinostrobin, pinocembrin and sakuranetin [1]. It is widely used for the prevention and treatment of many diseases [2]. The propolis extract is used as an antibacterial, disinfecting, and anti-inflammatory in oral preparations such as toothpastes [3]. Its antibacterial efficacy is due to the presence of the flavor galagin especially on Encountered cocci and Gram positive bacteria [4].

Propolis also contains aromatic acids such as caffeic, cinnamic, comaric and ferulic in addition to esters such as benzyl caffeate, benzyl coumarate and caffeic acid phenethyl ester [5]. The recent in vitro studies has confirmed the antibacterial, antifungal, anti-inflammatory, antiviral and anti-cancer activity of propolis such as its effect on human lung cancer which is still being studied [3].

Its special effect was observed on bacterial species, with significant effect on Gram positive bacteria including the human tubercle bacillus, but only limited activity against gram negative bacilli and the therapeutic effectiveness is due to a combination of several active substances and not to a single effect of one substance [6,7].

In this study, we aimed to evaluate the antibacterial effect of three different extracts of propolis, which were introduced with three types of solvents (Ethanolic extract, Methanolic extract and the Ethyl acetatic extract on four different bacterial strains: E.coli, Klebsiella, Pseudomonas aeruginosa and Staphylococcus aureus.

ABSTRACT
Propolis is a natural material that can be found in bee honey. It has many medical uses due to its antibacterial activity. In this study we aimed to estimate the antibacterial efficacy of three propolis extracts using three different solvents (Ethanol, Methanol and Ethyl Acetate). We experienced the three extracts on four different strains of bacteria (Klebsiella pneumonia, Ecoli, Pseudomonas aruginosa & Staphylococcus aureus). The results indicated that all the studied propolis extractions do not have any efficacy on Klebsiella neither on Ecoli. The methanolic extract has the greatest effect on Staphylococcus aureus as well as on Pseudomonas aruginosa in contrast of ethanolic and ethyle acetatic extracts which has no efficacy on any of the studied bacterial strains.
Results
When the inhibition zone of propolis extract against both bacterial groups was greater than 6 mm is considered active.

Table 1: Diameters of inhibition zone of propolis extracts on bacterial strains

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<th></th>
<th>EEP</th>
<th>MEP</th>
<th>ACEP</th>
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<tbody>
<tr>
<td>Escherichia coli</td>
<td>----</td>
<td>11 mm</td>
<td>----</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>----</td>
<td>12 mm</td>
<td>----</td>
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<tr>
<td>Staphylococcus aureus</td>
<td>----</td>
<td>15 mm</td>
<td>----</td>
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<tr>
<td>Klebsiella</td>
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Discussion
Our results can be very useful in order to estimate the therapeutic value of Syrian propolis as an antibacterial material. The experiment indicated that Klebsiella and E.coli are the least sensitive bacterial strains against propolis extractions. Although we find high sensitivity of Staphylococcus aureus and Pseudomonas aeruginosa to MEP.

According to the fact that P. aeruginosa has always been considered to be a difficult target for antimicrobial chemotherapy because of its ability to produce ß-Lactamase and the low permeability of its outer membrane, Propolis with its efficacy against P. aeruginosa which our experiment has proved can be an important material to fight P. aeruginosa resistance [9].

Our results is in agreement with Grange et al. who found that dilution of 1: 20 in nutrient agar, the propolis extraction had no effect on Klebsiella pneumonia [7]. Even though that our results shows no efficacy of ethanolic extracts on our studied bacterial strains.

This difference between results may be explained by the influence of the environment on the chemical composition of propolis.

References