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Title

Antibacterial effects of jujube extract against *Staphylococcus aureus*

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Statement of Problem: Plants have great importance in our lives because they fulfill our basic needs. Recently, people have used herbs to treat different diseases because they are cheap and effective. Medicinal plants can provide a wealth of antimicrobial agents, and hundreds have been investigated for biological activities. Anthocyanins are a group of polyphenolic secondary metabolites, also referred to as flavonoids, that are frequently found in human diets in the form of plants, fruits, and vegetables. Anthocyanin has been shown to exhibit a variety of biological functions, including anti-oxidant, immune-modulatory, anti-tumor, anti-inflammatory, and anti-bacterial effects. Anthocyanins are water-soluble pigments that give several fruits and vegetables, including red cabbage, beans, onions, radishes, jujube, berries, grapes, and pomegranates, their blue, purple, and red colors.

For checked antibacterial effects of anthocyanin in pathogen bacteria we invested *Staphylococcus aureus*. *S.aureus* is the bacterium commonly responsible for all major bone and joint infections; it can also cause a wide range of illnesses, from sepsis and deadly pneumonia to moderately severe skin infections. HA-MRSA, or MRSA, is a type of methicillin-resistant *Staphylococcus aureus* infection and is most frequently found in hospitals. This bacterium has another community-acquired strain known as CA-MRSA.

Research Purpose: Recent studies have investigated the antibiotic effects of anthocyanins, so in this study we investigated the antibiotic effect of jujube extract that contains anthocyanin



against the pathogen *S.aureus*. For this reason, in this study, the alcohol-water method was used to extract jujube extract. Then, we evaluated the antibacterial activity of jujube extract using a disc diffusion method in LB agar medium.

Research Method: We used the homogenize, water, and ethanol techniques to extract the anthocyanin-containing extract in order to examine the anthocyanin's properties. *Escherichia coli* and *Bacillus subtilis* were used in the antibacterial assay of barberry extract products. We use Luria-Bertani Agar medium for this experiment, which contains 1.5 g of agar, 0.5 g of yeast, 1 g of NaCl, 1 g of tryptone, and 100 ml of distilled water. The diameter of the growth inhibition zone of products containing barberry extract was determined following an 18-hour incubation period in bacterial culture. An uncontaminated area around the bacterium shows that the antibiotic therapy has successfully stopped or inhibited microbial growth.

Results and Conclusion: The inhibition zones were 19 and 25 mm for two concentrations (7 and 14 μ M) of jujube extract against *S.aureus*, respectively, implying that jujube extract can inhibit *S.aureus* growth effectively.

Keywords: natural molecules, antimicrobial, Luria-Bertani Agar, barberry, *Escherichia coli*, *Bacillus subtilis*