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Title

Anthocyanin extraction from barberry and check the antibacterial effect of its on the gram positive and negative bacterial

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Statement of Problem: Natural products are an important source of new drugs or serve as templates for the development of new synthetic drugs, from anticancer therapies to antibiotics. Due to the increasing prevalence of life-threatening bacterial, fungal, and viral infections and the ability of these human pathogens to develop resistance to current treatment strategies, there is a great need to find and develop new compounds to combat them. These molecules must have low toxicity, specific activity, and high bioavailability. The most suitable compounds for this task are usually derived from natural sources. The different results show that among the antibacterial compounds studied, anthocyanins have significant inhibitory activity against various types of bacteria. Anthocyanins are water-soluble pigments that give numerous fruits and vegetables their blue, purple, and red hues. Antioxidant and anti-inflammatory properties are shared by anthocyanins.

Research Purpose: For this reason, in this paper, we examine the antibacterial effect of barberry extract on gram-positive and gram-negative bacteria. According to the studies done, gram-positive and gram-negative bacteria have been identified, and they play a significant role in genitourinary, digestive, and hospital infections.



Research Method: In order to test the anthocyanin's characteristics, we extracted the anthocyanin-containing extract with homogenize, water, and ethanol methods. The antibacterial assay of barberry extract products was performed against *Escherichia coli* and *Bacillus subtilis*. For this test, we utilize Luria-Bertani Agar medium that 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. Concentrations studied, 1, 3 and 5 μM concentrations of the anthocyanin-containing extract are prepared and placed on discs. After 24 h incubation in bacterial culture, the diameter of the growth inhibition zone of barberry extract products was measured. A clean zone surrounding bacteria indicates that the antimicrobial treatment has effectively stopped or prevented microbial development.

Results and Conclusion: The antibacterial effects of barberry anthocyanin are therefore indicated by halos of lack of growth surrounding the disc. The minimum inhibitory concentration, or MIC, in microbiology is the lowest concentration of a chemical that can stop a particular type of bacterium from growing visibly. The lowest concentration of anthocyanin solution, which prevents bacterial growth in this test, is 5 μM . The clear zone size was 19 mm for *Escherichia coli* and 14 mm for *Bacillus subtilis*.

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

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