Blueberry Leaves: A Valuable Antimicrobial and Antibiofilm Agent Against Multidrug-Resistant Pathogens

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Multidrug-resistant bacteria pose a significant threat to global health by limiting the effectiveness of antibiotic treatments. Addressing this challenge requires collaborative efforts to develop new treatments, prevent infections, and ensure the responsible use of antibiotics in both healthcare and community settings. One promising strategy is testing the potential antibacterial properties of natural resources, such as byproducts containing substantial amounts of bioactive chemicals, particularly phenolic compounds [1]. Our group has recently conducted studies on blueberry leaves identifying phytochemicals and biological effects of these residues [2]. These by-products possess notable phenolic content and distinct antioxidant activity. Therefore, this study presents recent developments and applications of blueberry leaves, focusing on their emerging role in addressing multidrug-resistant bacteria. The study's findings present significant results, bioresidue extracts exhibited strong antioxidant activity, with a scavenging effect of 87.5% using the Ferric Reducing Antioxidant Power Assay and 84.2% using the 2,2′-azinobis(3-ethylbenzothiazoline-6-sulfonic acid) assay. Significantly, antimicrobial activity against *Staphylococcus aureus, Klebsiella pneumoniae*, and *Pseudomonas aeruginosa* achieved MIC values of 0.125 mg/mL, 0.250 mg/mL, and 0.5 mg/mL respectively. Moreover, the antibiofilm results highlight substantial inhibitory effects, the percentage of biofilm inhibition by Blueberry Leaves extract was found to be highest against *S. aureus* (74 %) followed by *K. pneumoniae* (61 %), and *P. aeruginosa* (53 %). These findings highlight the promising potential of blueberry leaves as an avenue to counter multidrug-resistant bacteria. The antioxidative, antimicrobial, and antibiofilm properties exhibited by blueberry leaves signify their prospective application in tackling antibiotic-resistant bacterial infections. This study sheds light on their potential significance in the field of medical interventions and pharmaceutical advancements.

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