

Honey Antibiofilm Effectiveness Against Multidrug-resistant Bacteria Isolated from Chronic Wound Infections.

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Abstract

Multidrug-resistant bacteria represent a growing concern and complex challenge in healthcare [1]. The presence of these microorganisms in diabetic foot ulcers (DFU) is responsible for high hospitalization and amputation rates [2]. Honey has demonstrated effectiveness in DFU treatment due to its anti-inflammatory and antibacterial properties, namely against bacterial biofilms and multidrug-resistant bacteria [3]. However, the variety of physical-chemical characteristics among different types of honey, such as the type of pollen, might confer different biological properties, potentially leading to differences in antimicrobial response [4]. This study aimed to assess the effect of different types and concentrations of honey against bacterial biofilm. Seven different types of honey from the region of Trás-os-Montes (Portugal) were tested at three concentrations: i) 1xMinimum Inhibitory Concentration (MIC), ii) 5xMIC, and iii) 10xMIC, against biofilms of *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *Candida albicans*. For *Candida albicans*, honey type-3, and type-4 removed 80.2% and 78.4% of biofilms, respectively, which was significantly higher than type-5 (8.87%), type-8 (27.5%), and type-9 (21.5%). Similarly, biofilm removal promoted by the honey type-2 (64.1%) and type-4 (57.2%) was greater than type-10 (28.5%) for *E. coli*. Principal Component Analysis suggested correlations between different pollen content and antimicrobial activity. Principal regression analyses were significant suggesting negative correlations of biofilm removal with pollen from *Erica* sp. and *Frangula alnus*, and positive correlations with pollens from *Corrigiola telephiifolia*. Differences in bacterial responses may be due to variations in honey's pollen content and bacterial strain sensitivity.

Biography:

Andréa Bezerra has a master's degree from the University of Porto. Currently, she has a research fellowship at the University of Trás-os-Montes e Alto Douro at the Project "Honey+ - New reasons to care honey from the Natural Park of Montesinho: A bioindicator of environmental quality & its therapeutic potential" and through the project UIDB/50006/2020.

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