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Antibacterial activity and minimum inhibitory concentrations of plant extracts on bacterial pathogens

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In the context of COVID-19, the use of face masks has been recommended as a preventive measure against the spread of SARS-CoV-2. Despite their health benefits, usage of single-use masks represents a threat to the environment as they are manufactured from long-lasting plastic materials. The application of antimicrobial agents in the tissues used to produce masks would be an additional hurdle on the prevention of other respiratory infections and secondary bacterial infections that occur from touching contaminated masks. In this context, impregnation of the fabrics with plant extracts is an attractive approach since they are potentially safe and free of adverse side effects and powerful antimicrobials. In a preliminary study, the objective was to evaluate 16 plant extracts to select the most efficient against 55 pathogenic microorganisms. Initially the plants extracts were tested at 50%, however, the minimum inhibitory concentration (MIC) was only determined for extracts that demonstrated antimicrobial activity. MICs of each extract were determined by broth microdilution in 96-wells microtiter plates (tested concentrations between 50.00 and 0.78% V/V) against 34 pathogenic bacteria. According to the results obtained, it was possible to select two plant extracts, both extracted with 1:1 ethanol:water, as the most effective against the majority of the pathogens tested, with MICs between 50.00 and 1.56%. It is important to highlight that Gram-positive bacteria were eliminated more easily than Gram-negative bacteria. Although being a preliminary work and more tests are needed, the two plant extracts could be good candidates to be impregnated into tissues in order to eliminate pathogens and avoid health problems associated with them.

Biography

Marta Carvalho has a Master's Degree in Applied Microbiology (2017) and a Degree in Microbiology (2015), both obtained at ESB-UCP. Her first professional research activity was in the project MOBFOOD, in which experiments with different food matrices were conducting in close relation to food industries. Currently, Marta is a research technician in the scientific research project PlantCovid, which aims to develop products based on plant extracts with antimicrobial function. She has already published 2 research articles in scientific journals with peer review and 10 poster presentations at international/national scientific congresses. Additionally, she recently contributed as daily supervisor of a Master's student and also supervised two student in his final project of bachelor's degree.

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