

DETERMINATION OF MINIMUM INHIBITORY CONCENTRATIONS OF SEVERAL PLANTS EXTRACTS AGAINST DIFFERENT BACTERIAL PATHOGENS

Marta Carvalho¹, Adma Melo¹, Tiago Afonso¹, Joana Barbosa¹, Tânia Ribeiro¹, Freni Tavarria¹, Márcio Carcho², Lilian Barros², Manuela Pintado¹ and Paula Teixeira¹

¹Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Porto, Portugal,

²Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal

marta_carvalho1992@hotmail.com

ABSTRACT

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. Reusable fabric masks are an alternative to reduce the risk of pollution and the amount of plastic wastage. 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 evaluated sixteen 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 was determined by broth microdilution in 96-wells microtiter plates (tested concentrations between 50.00 and 0.78% V/V) against different pathogenic bacteria. According to the results obtained, it was possible to selecte two plant extracts, both extracted with 1:1 ethanol:water, as the more effective against most 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.