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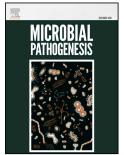
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Phytochemical analysis and antibacterial activities extracts of mangrove leaf1against the growth of some pathogenic bacteria2

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Abstract

12 In this study, the effects of water, ethanol, methanol and glycerin at five levels (0, 31.25, 83.33, 125 and 250 ml) were investigated on the efficiency of mangrove leaf extraction using 13 mixture optimal design. The antimicrobial effect of the extracts on Streptococcus pneumoniae, 14 15 Enterococcus faecium and Klebsiella pneumoniae was evaluated using disk diffusion, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) methods. The 16 mangrove leaf extraction components were identified through gas chromatography/mass 17 spectrometry (GC/MS). Phytochemical analysis (alkaloids, tannins, saponins, flavone and 18 glycosides) were evaluated based on qualitative methods. Antioxidant activity of extracts was 19 measured using 2,2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant potential 20 21 (FRAP) methods. Maximum antimicrobial effect was observed in Enterococcus faecium and highest resistance against mangrove leaf extract in Enterococcus faecium and Klebsiella 22 pneumoniae, respectively. Increasing concentration of mangrove extracts had a significant effect 23 $(p \le 0.05)$ on inhibition zone diameter. The MICs of the mangrove leaf extraction varied from 4 24 mg/ml to 16 mg/ml. The optimum formulation was found to contain glycerin (0 ml), water 25 (28.22 ml), methanol (59.83 ml) and ethanol (161.95 ml). The results showed that the highest 26 27 antioxidant activity was related to optimum extract of mangrove leaf and ethanolic extract respectively. The results of phytochemical screening of Avicennia marina leaves extract showed 28 29 the existence of alkaloids, tannins, saponins, flavone and glycosides. 2-Propenoic acid, 3-phenylwas the major compound of Avicennia marina. The results of non-significant lack of fit tests, and 30 F value (14.62) indicated that the model was sufficiently accurate. In addition, the coefficient of 31 32 variations (16.8%) showed an acceptable reproducibility.

Key words: Mangrove leaf, Optimization, Phytochemicals, Antimicrobial.

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