Phytochemical study of the Ziziphora spp. and its antibacterial activity against vancomycin-resistant enterococcus

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Abstract

Due to the emergence and development of antibiotic-resistant bacteria, combating infectious microorganisms has currently been one of the most challenging human health issues. For example, vancomycin-resistant enterococci (VRE) are of utmost importance for medical and public health because of their serious multidrug-resistant [1]. Nowadays, antibiotic resistance develops much faster than discovering, developing, and producing effective antibiotics in the pharmaceutical industry. Meanwhile, medicinal plants with antibacterial phytocompounds/secondary metabolites have shown to be promising in the inhibition of a wide range of pathogenic microorganisms [2].

In this study, the phytochemicals of the methanolic extract of the Ziziphora spp. leaves were determined via GC-MS analysis. Moreover, the extract's antibacterial activity was also evaluated against, E. coli, and vancomycin-resistant enterococcus (VRE) bacterial strains using agar well-diffusion and broth microdilution methods.

Based on the results, about 80 percent of the extract consisted of phytocompounds with known pharmaceutical activities. Of these, 5-Methyl- 2-(1-methylethylidele)-Cyclohexanone ($C_{11}H_{18}O_2$) was the dominant component of the extract. Although this extract did not affect the E. coli strain significantly, it exhibited considerable antibacterial activity against VRE, in a dose-dependent manner, and a MIC of 125 µg/ml.

In conclusion, the findings of this study revealed that the methanolic extract of the leaves Ziziphora spp. is rich in phytocompounds with potent antibacterial activity which can be applied against antibiotic-resistant bacteria.

Keywords: phytochemistry, Ziziphora persica, Herbal medicine, Antibacterials

Refferences

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