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Abstract

Cistaceae Methanolic extract and its fractions on growth inhibiting of Extended Spectrum β-lactamase and Carbapenemase-Producing Klebsiella pneumoniae isolates in blood culture

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Abstract:

Nosocomial Infections are a serious health concern worldwide, the ever increasing resistance of pathogens such Enterobacteriacceae to many antibiotic drug classes it is regarded as the most common cause of death in hospitals. These factors urges finding new products to overcome this problem. Given the fact that plants have been used as active substance of antibiotics by industry, and as anti-infections by people in folk medicine. This study aims determing Extended Spectrum β-lactamase (ESBL) and Carbapenemase-Producing (CP) Klebsiella pneumoniae (KP) isolated from blood culture, and their sensibility to Cistus monspeliensis and Cistus salviifolius extracts. Identification of six KP was based on general phenotypic methods. Susceptibility testing to antibiotics was performed by disc diffusion method and broth micro-dilution method according to EUCAST guidelines. Molecular analysis of genes mediated resistance: blaCTX-M, blaSHV, blaTEM, blaOXA-48, blaNDM , blaMCR-1 and blaMCR-2 was carried by PCR. Methanolic extracts of two Cistus were obtained using Soxhlet, fractionated with different solvent: hexane, dichloromethane, ethyl acetate and n-butanol. Then extracts were screened for their antibacterial activity against ESBL and CP strains of KP to determine Diameter of Inhibition Zone (DZI) and Minimal Inhibition Concentration (MIC). The results of antibiotic resistance phenotype revealed that strains are multi-drug resistant (with Colistin MIC value 2mg/L), ESBL KP was blaCTX-M positive, and ESBL-CP KP presented a coexistence of blaSHV and blaOXA-48. Both strains were negative to blaMCR-1 and blaMCR-2. Our data obtained with organic extracts revealed a significant activity against tested strains. Ethyl acetate fraction of C. salviifolius and dichlomethane fraction of C. monspeliensis showed the higher inhibitory effect (MIC 3,37 mg/mL). In light of the growing concern with antibiotic resistance, our results show that use of products derived from plants could be an excellent source for natural antibacterial agents.Therefore, further studies have to conduct for identifying, isolating and chemical structure detemination of bioactive molecules presented in those extracts.

Biography:

Zalegh Imane has completed her Master degree in Applied Microbiology and Biological Engineering at the age of 24 years from Faculty of Sciences and Technologies of Mohammedia, University Hassan II Casablanca MOROCCO, and actually PhD student in Microobiology and Bioactive Molecules, in Research Unit Microbiology, Hygiene & Biomolecule, Laboratory of Virology, Microbiology, Quality & Biotechnology / Ecotoxicology and Biodiversity and Laboratory of Physical Chemistry & Bioorganic Chemistry URAC 22 in the same University.

Publication of speakers:

1. Hamida, Saida & Zalegh, Imane & Saidi, Fairouz & Benmanssour, Nabahat & González-Mas, M. & Blázquez, María & Rajaa, Ait & Akssira, Mohamed. (2020). Chemical composition and antibacterial effect of Smyrnium olusatrum L. Fruit Essential Oil. Mediterranean Journal of Chemistry. 10. 577. 10.13171/mjc10602006231292iz.
2. Hamida, Saida & Zalegh, Imane & Saidi, Fairouz & Benmanssour, Nabahat & González-Mas, M. & Blázquez, María & Rajaa, Ait & Akssira, Mohamed. (2020). Chemical composition and antibacterial effect of Smyrnium olusatrum L. Fruit Essential Oil. Mediterranean Journal of Chemistry. 10. 577. 10.13171/mjc10602006231292iz.

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