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The antibacterial activity of *Zataria multiflora* Boiss and *Carum copticum* on IMP-type metallo-beta-lactamase-producing *Pseudomonas aeruginosa*

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Carbapenem resistance due to acquired metallo-beta-lactamases (MBLs) is considered to be more serious than other resistance mechanisms. The aim of this study was to evaluate the antibacterial activity of *Zataria multiflora* Boiss and *Carum copticum* plants on IMP-producing *P. aeruginosa* strains. This experimental study was carried out on hospitalized burn patients during 2011 and 2012. Antibiotics and extracts susceptibility tests were performed by disc diffusion and broth microdilution methods. MBL detection was performed by combination disk diffusion test (CDDT). The *bla(VIM)* and *bla(IMP)* genes were detected by PCR and sequencing methods. Using combination disk diffusion test method, it was found that among 83 imipenem resistant *P. aeruginosa* strains, 48 (57.9%) were MBL producers. PCR and sequencing methods proved that these isolates were positive for blaIMP-1 genes, whereas none were positive for *bla(VIM)* genes. The mortality rate of hospitalized patients with MBL-producing *Pseudomonas* infection was 4/48 (8.3%). It was shown that *Zataria multiflora* and *Carum copticum* extracts had a high antibacterial effect on regular and IMP-producing *P. aeruginosa* strains in 6.25 mg/ml concentration. The incidence of MBL-producing *P. aeruginosa* in burn patients is very high. In our study, all MBL-producing isolates carry the blaIMP-1 gene. Therefore, detection of MBL-producing isolates is of great importance in identifying drug resistance patterns in *P. aeruginosa*, and in prevention and control of infections. In this study, it was shown that extracts of Z. multiflora and C. copticum have high antibacterial effects on ß-lactamase producing *P. aeruginosa* strains.

Biography

Fatemeh Fallah has completed her Doctoral studies from Tehran University and Post-doctoral studies from Shahid Beheshti University School of Medicine. She is the Director of lab in PIRC. She has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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