ABSTRACT

Linum usitatissimum and Euphorbia microsciadia are the two main plants species that are growing in vast diversity of Iran. These plant species have medicinal application in different regions of Iran. Nanoparticles are considered as greatest antibacterial agents for the prevention of bacterial growth on some medical materials. It seems these medicinal plants in presence of nanoparticles are effective tools to eliminate the severe bacterial infections. The hydroalcoholic extracts of these plants were obtained by maceration method. The extracts in presence of ZnO/Zn(OH)$_2$ nanoparticles were examined for the antimicrobial activity by broth macrodilution and agar disk diffusion. Additionally, the minimal inhibitory concentration and minimum bactericidal concentration were evaluated for the developed antibacterial materials. This retrospective study was done to survey the effect of plant extract with ZnO/Zn(OH)$_2$ nanoparticles suspension on bacteria and antioxidants content of the extracts were also determined. The result obtained demonstrated that the highest antioxidant activities associated with the shoot of L. usitatissimum (Total phenolic content) TPC1: 128.24 ± 1.127 mg gallic acid equivalents/g of dried extract, DPPH: 30.57 ± 0.4% inhibition and Total flavonoid 2: 95.04 ± 0.53 mg rutin equivalents/g of dried extract). Furthermore, euphol was isolated from acetone extract of E. microsciadia using thin layer chromatography and euphol’s structure was characterized by high-resolution 1D and 2D NMR spectra. Combination of metal oxide nanoparticles with the aforementioned plants extracts can be effective in the eradication of the bacterial infections, and as a good alternative for antibiotics also.

Keywords: Linum usitatissimum; Euphorbia microsciadia; Euphol; Antibacterial; Antifungal

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This article was originally published with errors. This version has been corrected. Please see Corrigendum (http://dx.doi.org/10.1080/19443994.2015.1130953).