عنوان مقاله:

Green Synthesis of Silver Nanoparticles and Antibacterial Properties of Extracts of Capparis spinosa Leaves

محل انتشار:

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خلاصه مقاله:

Today, the production and use of materials with nanometer diversity is increasing day by day due to the unique and fascinating features of these materials. Until now, various physical and chemical methods have been used for the synthesis of silver nanoparticles (AgNPs), but the use of plants for the synthesis of AgNPs is very fast, simple, non-toxic, and environmentally friendly. In this research, the aqueous extract (AE) of Capparis plants was used for the biosynthesis of AgNPs. The color of the silver nitrate solution changed to reddish color after adding the extract. The Antimicrobial activity of AgNPs against Streptococcus pyogenes, Streptococcus pneumoniae, S. saprophyticus, Hafnia alvei, Acinetobacter. baumannii, Enterococcus faecalis, Proteus mirabilis, Serratia marcescens, Staphylococcus aureus bacteria were investigated by minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) using microdilution method. The amount of total phenol and flavonoids in the methanolic extract (ME) of capparis leaves was equal to ۲۲۹.۹– ۲۸.۰۹ mg per gram of dry matter. The antioxidant properties of the ME of capparis were ۸۵.۱۸%. The greatest effect of the ME of the medicinal plant capparis was ۰.۲۳۱۵ on the inactivity of E. coli and the greatest effect of green AgNPs synthesized from the AE of the medicinal plant Capparis with ELISA of ۰.۳۷۴۰ was on the inactivity of S. mutanis. The maximum diameter of the inhibitor zone (MDIZ) was ۵.۵ mm due to the inactivity of H. alvi bacteria. The results of this research showed that the leaf extract of the Capparis spinosa f. inermis Knocheplant is capable of synthesizing AgNPs and the synthetic nanoparticles showed good antimicrobial activity against pathogenic strains in vitro.

کلمات کلیدی:

Biosynthesis, C. spinosa, Antimicrobial activity, microdilution, AgNPs