

عنوان مقاله:

Antifungal Effect of Silver Nanoparticles Synthesized by Rheum turkestanicum Extract against Candida Species

محل انتشار:

بیستمین کنگره بین المللی میکروب شناسی ایران (سال: 1398)

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خلاصه مقاله:

Introduction: Fungal Infections caused by opportunistic fungi especially candida species are prevalent in human societies today. The most important challenge dealing with different species of Candida is due to their resistance to common antifungal drugs. The occurrence of fungal species resistant to antifungal drugs, convince the researchers to work on new therapeutic methods with minimal side effects for humans. In recent years; the methods of green chemistry for the synthesis of metal nanoparticles have been targeted by many investigations. The aim of the present study was to assess anti-fungal effects of silver nanoparticles (Ag-NPs) synthesized by Rheum turkestanicum extracts against some Candida species. Materials & Methods: in the current study Rheum turkestanicum was used for synthesis of Ag-NPs and six candida species were studied. Fresh Rheum turkestanicum shoots were collected from Daregaz, Khorasan-e-Razavi province. They were dried and powdered. The shoots extract was prepared by taking of powder with distilled water. To synthesize Ag-NPs, the extract combined with silver nitrate solution. After preparation of the Ag-NPs, their antifungal effects were evaluated by broth microdilution method according to CLSI-M27A3 protocol. The fungal species were associated with different concentrations of the extract and drugs. Finally, MIC and MFC was determined. Results: Synthesized silver nanoparticles by Rheum turkestanicum showed antifungal effects against candida species. C.albicans and C.glabrata with MIC=0.4 µg/ml were the most sensitive species to Ag-NPs. The MICs of Ag-NPs for C.albicans, C.glabrata (2 strain), C.tropicalis, C.krusei and C.parapsilosis were 0.4, 0.4, 0.8, 0.8 and 1.6 µg/ml respectively. C. albicans with MIC=2.08×10⁴µg/ml and MFC=16.67×10⁴µg/ml was the most sensitive species to Rheum turkestanicum extract alone. This extract did not have fungicidal effects on C.krusei, C.glabrata and C.parapsilosis. The MICs of fluconazole and clotrimazole for C.albicans was 8 µg/ml and 0.0625 µg/ml respectively. Conclusion: Synthesized silver nanoparticles by Rheum turkestanicum were more effective on Candida species than plant extracts alone. Candida albicans was the most sensitive species to both extracts. Rheum turkestanicum plant is proper source for synthesized silver nanoparticles and also revealed significant anti-fungal activity against Candida species.

کلمات کلیدی:

Silver nanoparticles, Rheum turkestanicum, Microdilution broth, Candida

