

عنوان مقاله:

Biosynthesis and characterization of copper nanoparticles constructed by fungi isolated from Several industrial centers in Isfahan

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خلاصه مقاله:

Attention to the use of microorganisms, including fungi in nanoparticles production is due to their cleanliness, high adaptability to the environment and easily manufacturing. The aim of this study was biosynthesis of copper nanoparticles by fungi isolated from soil and industrial wastewaters and characterization of the synthesized nanoparticles. Sampling was carried out from the soil and waste water of several coppersmiths and plating plants in Isfahan. After analysis of chemical and biological parameters of samples, Czapek Dox medium containing CuSO_4 was used for isolation of fungi. Minimum inhibitory concentration of copper ions on the selected fungi was assessed by agar diffusion method. The most resistant fungi were identified based on morphology and molecular detection. In the second step, copper nanoparticle production by selected fungi was investigated and the characteristics of the bionanoparticles were analyzed by X-ray diffraction (XRD), UV-visible spectroscopy and transmission electron microscopy (TEM). Among the Cu-resistant fungi, *Fusarium solani* CBS490.62 and *paecilomyces variotii* BAB-1547 possessed the highest resistance to copper with MIC of 4.5 mM and 4 mM, respectively. The results of UV-visible spectroscopy showed an absorption peak after applying the heat at 80 °C in the wavelength of 400 nm. X-ray diffraction and TEM results showed that the copper nanoparticles were in the form of hexahedron with the diameter of 17-29 nm. The isolated fungi were efficient for biological synthesis of copper nanoparticles which have been detected with minimal environmental contamination and less toxicity than nanoparticles synthesis by physical and chemical methods

کلمات کلیدی:

biosynthesis, Copper nanoparticles, Fungi, XRD, UV-visible spectroscopy, TEM

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