

## عنوان مقاله:

Copper nanoparticles synthesized using Echinops sp. root extract for antimicrobial applications

## محل انتشار:

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## خلاصه مقاله:

Metallic nanoparticles synthesised via green synthetic route have been proved to be detrimental against pathogens. An attempt was made to synthesise copper nanoparticles (EcS-Cu NPs) using the root extract of Echinops sp., Ethiopian medicinal plant. The most advanced techniques were employed to characterize the NPs. The presence of absorbance maxima,  $\lambda_{max}$  at ۴۵۴ nm confirms the formation of EcS-Cu NPs. The role of biomolecules as capping agents for EcS-Cu NPs was authenticated by FT-IR spectra. The presence of a single weak peak in the XRD pattern of NPs confirmed amorphous nature of NPs. The purity of the NPs was corroborated by SEM-EDAX analysis. TEM-HRTEM-SAED analysis authenticated the presence of partially crystalline natured copper NPs with the appearance of weak concentric SAED rings. The EcS-Cu NPs showed significant synergistic antibacterial influence verses *S. aureus*, *E. coli*, *P. aeruginosa*, and *E. aerogenes*. The uppermost zone of inhibition of ۱۳ mm was inscribed against *S. aureus* bacteria. EcS-Cu NPs exhibited better antibacterial activities against gram positive and gram negative bacteria.

## کلمات کلیدی:

Amorphous, Biomolecules, Green synthesis, Medicinal Plants, Pathogens

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