

# CHEMOSYNTHESIZED COPPER NANOPARTICLES: AN EFFECTIVE FUNGICIDAL AGENT AGAINST PLANT FUNGI

**AVIANSH P. INGLE AND MAHENDRA RAI**

Department of Biotechnology, Sant Gadge Baba Amravati University, Amravati-444602 (MS), India  
Email: [ingleavinash14@gmail.com](mailto:ingleavinash14@gmail.com)

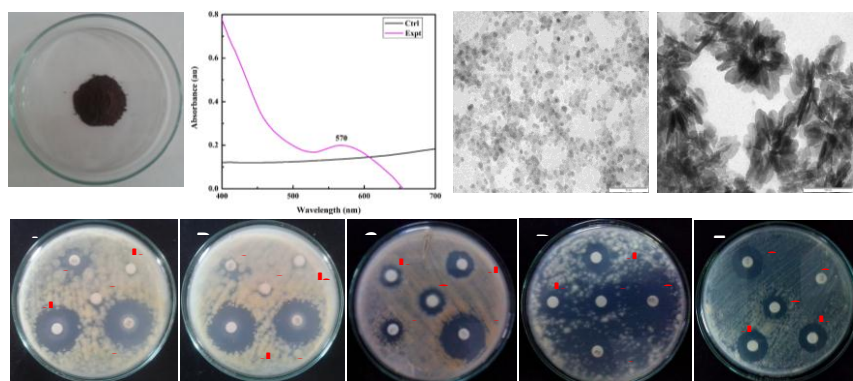
## Abstract

Nanotechnology is an emerging branch of science, which has potential to solve many problems in different fields including agriculture and part of copper nanoparticles attract biologists because of their significant and broad-spectrum bioactivity. In the present study, we report the chemical synthesis of copper nanoparticles from copper nitrate using CTAB as reducing and stabilizing agent. Initially, the formation of dark purple-violet colour from faint blue colour indicates the synthesis of copper nanoparticles. Primary detection carried out by UV-Vis spectrophotometer analysis showed the absorbance peak at 570 nm which is specific for copper nanoparticles. Further, characterization using Transmission Electron Microscopy confirmed the formation of spherical and square shape nanoparticles in the size range of 6-20 nm. Zeta potential analysis showed that the chemosynthesized copper nanoparticles were comparatively stable having zeta potential of 35 mV. Further, antifungal potential of chemically synthesized copper nanoparticles was evaluated against common plant pathogenic fungi like *F. oxysporum*, *F. moniliforme*, *F. culmorum*, *F. tricinctum* and *Aspergillus niger*. The maximum antifungal activity was reported against *A. niger* followed by *F. moniliforme*, *F. oxysporum*, *F. tricinctum*, whereas the minimum activity was reported against *F. culmorum*. Similarly, synergistic effect of these copper nanoparticles was also tested in combination with commercial antifungal agent (ketoconazole), they obtained results proved that the efficacy of the antifungal agent used get enhanced when used in combination with copper nanoparticles.

The aim of the present study is to develop novel and effective alternative to the chemical fungicides. In this context from the present study it can be concluded that copper nanoparticles can be used for the development of nanofungicides after extensive studies on its toxicity.

**Keywords:** Chemosynthesis, copper nanoparticles, broad-spectrum bioactivity, plant fungi.

## Figures:



## References

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