

Green Synthesis of Copper Nanoparticles Using *Syzygium cumini* (Leaf, Seed, Pulp) Extracts and their Applications

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The use of copper nanoparticles is having a huge attention of researchers from different fields due to its catalytic, optical, photonic, electric and antimicrobial activities. The biosynthesis of copper nanoparticles using plant extract is environment friendly, non-toxic and economical. Therefore, the present study aims to provide method of green synthesis of copper nanoparticles using *Syzygium cumini* extracts (Leaf, seed, and pulp) its antimicrobial activity and their effect on seed germination. So, to achieve green synthesis of copper nanoparticles, 5 mM of copper sulphate pentahydrate (CuSO₄.5H₂O) solution (50ml) was taken and 1 ml of plant extract was mixed, the color of the solution changed from light blue to dark brown thus, confirming the formation of copper nanoparticles, kinetics of the reaction was studied with the help of UV- visible spectrophotometer at 568 nm, these nanoparticles were characterized by FE-SEM. The antimicrobial activity of copper nanoparticles was tested on *Escherichia coli*, *Bacillus subtilis* and *Pseudomonas fluorescens*. This antimicrobial activity was profound against *Pseudomonas fluorescens* and *Bacillus subtilis*, however mild antibacterial activity was observed in the case of *Escherichia coli*. According to this study, *Syzygium cumini* (Leaf, seed, and pulp) extracts can be successfully used to make copper nanoparticles having significant antibacterial property.

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