

Bionanoparticles from moringa as antimicrobial activity and Its application in water purification

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Background: Nanotechnology is the greatest promising technique for generating new applications in water purification. Green synthesis of silver nanoparticles and copper oxide nanoparticles is an eco-friendly, cheap and non-toxic more than chemical and physical methods. **Aim:** This study focuses on green synthesis, characterization, antibacterial activities of silver nanoparticles and copper oxide nanoparticles synthesized using *Moringa oleifera* leaf and stem extract and its application in water purification. **Materials and Methods:** The green synthesis of silver nanoparticles was done by using *Moringa oleifera* leaf and stem extract and 1mM of silver nitrate solution while copper oxide nanoparticles were synthesized by using *Moringa oleifera* leaf and stem extract and 10mM of copper sulfate pentahydrate solution. pH, temperature and the mixture reaction time are parameters affecting the formation of silver nanoparticles and copper oxide nanoparticles. **Results:** In this study, various techniques and devices used to characterize and confirms the formation of silver nanoparticles and copper oxide nanoparticles included visual observation, UV-Vis spectroscopy, TEM, FTIR, and EDX. Silver nanoparticles and copper oxide nanoparticles showed antimicrobial activity against *E. coli* ATCC 8739 and *S. typhi* ATCC 14028 and isolated microorganisms from tested water sample which included *Pseudomonas aeruginosa* and *Klebsiella variicola*. Cellulose filter paper which coated with silver nanoparticles and copper oxide nanoparticles showed good effect in water purification as its good antimicrobial activity against microorganisms, increasing pH value and reducing conductivity, total alkalinity values and Pb concentration value. **Conclusion:** The results from this study indicate that bionanoparticles from moringa have an antimicrobial activity that can be applied in water Purification.

Keywords: Cellulose filter paper; Copper oxide; Nanoparticles; *Moringa oleifera*; Nanotechnology; Silver

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