Bactericidal activities of green synthesized AgNPs in the fight against antimicrobial resistance

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The global increase in outbreaks and mortality rates associated with multi-drug- resistant microbes is a major public health concern, and calls for alternative and effective antimicrobial agents. Plant-derived compounds have shown potential in combating the most dreadful diseases, and currently used to reduce metal precursors to form biogenic metallic nanoparticles with remarkable antimicrobial activities, such as silver nanoparticles (AgNPs). Plant-synthesized AgNPs present the next- generation of antimicrobial agents, and has potential to help solve the antimicrobial resistance problem. The study reports on the enhanced antibacterial and antifungal activities of AgNPs synthesized from various African medicinal plant extracts.

Plant extracts from Terminalia mantaly, Salvia africana-lutea and Cotyledon orbiculate were used to synthesize AgNPs. The physico-chemical properties of the AgNPs were characterized by spectrophotometer, zetasizer and transmission electron microscope. The antibacterial and antifungal activities of the biogenic AgNPs were assessed using agar well diffusion and microdilution assays. The AgNPs exhibited enhanced antibacterial activity against the test Gram-positive and Gram-negative microorganisms when compared to the crude extracts. Their bactericidal effect was ≥20-fold higher than the extracts alone. These biogenic AgNPs can potentially be used as alternative antimicrobial agents for treatment of infectious diseases. Further studies are underway to study the antimicrobial mechanism of plant synthesized-AgNPs and identify the phytochemicals involved in their synthesis.

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