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Evaluation of the Antibacterial Activity of Silver (Ag), Zinc (Zn) and Copper (Cu) Nanoparticles from Aqueous Extract of *Spondias Mombin* Leaves

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Background: *Spondias mombin* is a fruit-bearing tree and its leaf extracts have been reported to possess antimicrobial properties amongst other therapeutic properties such as being anxiolytic, hypoglycaemic, antiepileptic, antipsychotic, sedative, antioxidant etc. The objective of this study is to determine the antibacterial properties of metallic (Ag, Zn and Cu) nanoparticles (NP) from the leaf of *Spondias mombin* aqueous extracts (SMAE).

Methodology: Metallic (Ag, Zn and Cu) nanoparticles were produced from the leaves of Spondias mombin aqueous extracts (SMAE) through green synthesis. Antimicrobial activities of the synthesized and characterised NPs against *Escherichia coli, Staphylococcus aureus* and *Pseudomonas aeruginosa* were determined by agar well diffusion technique.

Results: The synthesized NPs had size ranging from 65-90 nm. UV spectroscopy absorption spectra of Ag, Zn and Cu NPs had absorbance peaks at 267, 262 and 765 nm respectively. FT-IR spectrometry of Zn NP, Cu NP, and SMAE gave wave number ranging from 895.71-3320.67, 747.02-3225.45 and 658.25-3674.49 respectively. FT-IR analysis showed that SMAE acted as reducing and stabilizing agent while the NPs exhibited lower energy absorption band when compared to the plant extract. The NPs demonstrated higher antimicrobial activities against *Staphylococcus aureus* than *Pseudomonas aeruginosa* and *Escherichia coli*. The copper NP gave antimicrobial activity higher than those of Ag and Zn NPs, and which were also higher than SMAE.

Conclusion: The result from this study gives an in-sight into the prospects for the production of pharmaceutical formulations from metallic NPs of Spondias *mombin* and for the development of novel antimicrobial agents for clinical and biotechnological applications.