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## Characterization and Antimicrobial Potential Of Silver Nanoparticle Using *Carica papaya* Leaf Extract

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### ABSTRACT

Recently, the occurrence of resistant bacteria has led to the wide application of nano-technology whose structural components size ranges from 0.1 – 100nm. The biosynthesis of nanoparticles using plant extracts is of tremendous interest due to their numerous activities, accessibility, a wide spectrum of bioactive reducing agents and an excellent alternative for chemical and physical methods. Based on the important phytochemicals and biomedical applications of *Carica papaya*, this study aimed at the characterization and antimicrobial potential of biosynthesized silver nanoparticle using *Carica papaya* leaf extracts (CPL-AgNPs). The fresh leaves of *Carica papaya* extracted in aqueous, methanol and ethyl acetate and the phytochemical screening of the aqueous leaf extract was done. The CPL-AgNPs were characterized by UV-visible spectrophotometer, Fourier Transform Infrared spectroscopy (FTIR), Scanning electron microscope. The antimicrobial potential of the CPL-AgNPs was determined. The Phytochemical analysis revealed that saponin, alkaloids and carbohydrates are strongly positive in the aqueous extract while glycosides and steroids were not detected in the aqueous extract. The methanol, ethyl acetate and aqueous extracts of the *Carica papaya* was able to bio-reduced the AgNO<sub>3</sub> to biosynthesized CPL-AgNPs by change in colour from colourless to dark brown. The UV-spectra of the aqueous, methanolic and acetyl ether leaf extract AgNPs has a sharp peak at 470 nm, 470 nm and 480 nm suggesting the formation of growing number of silver nanoparticles. FTIR shows different peaks, which conformed to the different functional groups and proven the presence of protein stabilizing agents. The scanning electron micrograph confirmed the shape of the biosynthesized CPL-AgNPs to be relatively spherical and the sizes ranging from 5-200 nm. The CPL-AgNPs had effective antimicrobial activity against the test bacterial pathogens with zones of inhibition ranging from 4 – 16 mm. All the test pathogens were susceptible to the nanoparticles except *B. subtilis* and *K. pneumonia* that was not susceptible to for the AgNO<sub>3</sub> from *Carica papaya* methanol extracts. These findings revealed that CPL-AgNPs shape and size of nanoparticles and had effective bactericidal activity.

**Keywords:** Characterization, Antimicrobial Potential, Silver Nanoparticle Using *Carica papaya*, Leaf Extract

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