Green synthesis and characterization of *Carica papaya* leaf extract coated silver nanoparticles through X-ray diffraction, electron microscopy and evaluation of bactericidal properties

OBJECTIVE

Synthesize and characterisize eco-friendly silver nanoparticles from *Carica papaya* leaf extract (CPL-AgNPs) trought XRD, TEM, SEM, Uv-Vis and FTIR, taking into account the antimicrobial properties.

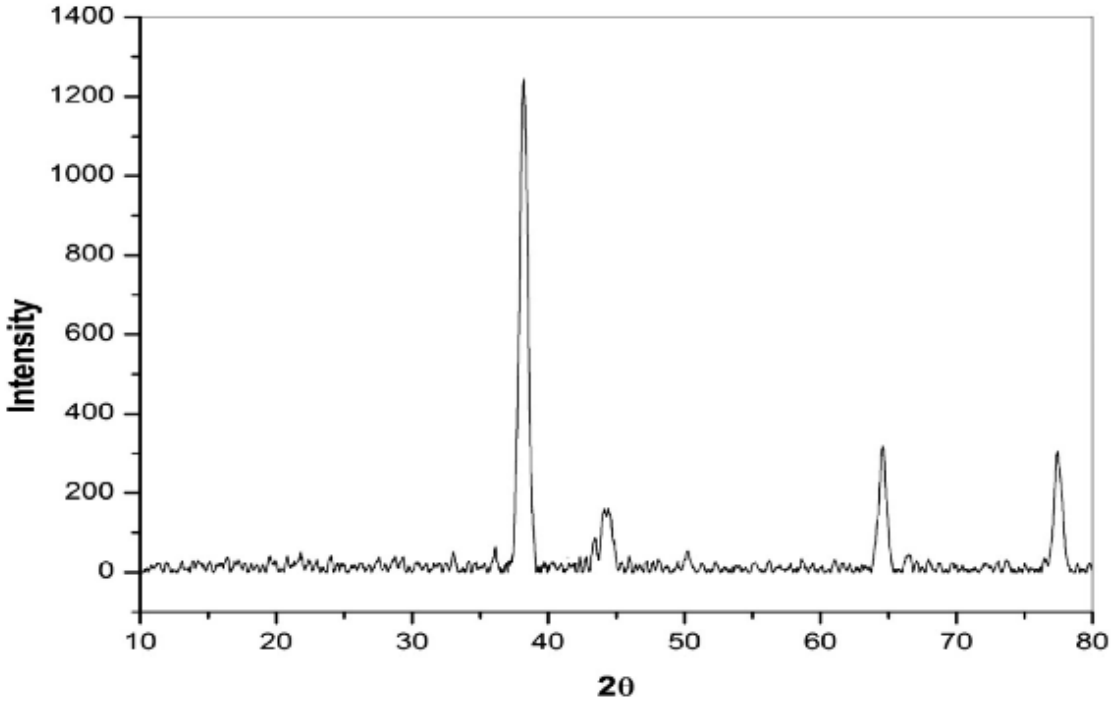
SAMPLE PREPARATION

The studies were performed on a biologically reduced silver-nitrate solution drop coated onto glass slides.

DATA ACQUISITION

Diffraction measurements were made by an X-ray diffractometer operating at a voltage of 40 kV and a current of 30 mA with Cu Kα radiation. The scanning of biosynthesized silver nanoparticles were exercised in 2θ region. The Debye–Scherrer equation was employed to calculate the average particle size of the CPL-AgNPs. $D = k\lambda/\beta 1/2 \cos\theta$

REPRESENTATIVE FIGURE AND RESULT



XRD data show diffraction peaks at 2θ= 38.2°, 44.4°, 64.6°, 77.5°, and can be indexed to (111), (200), (220), (311), and (222) planes (face centered cubic structure) of pure silver ions indicating the biosynthesis of silver nanoparticles.

CONCLUSION

The green synthesis and characterization of CPL-AgNPs was done and confirmed by UV–visible spectrophotometer, FTIR, SEM, TEM, XRD and EDX techniques. The CPL extract mediated synthesis of silver nanoparticles was efficient and provides additional property such as bactericidal efficiency and might act as long searched alternative and could be the answer to antibiotic resistance.

REFERENCE

Banala et al, "Green synthesis and characterization of *Carica papaya* leaf extract coated silver nanoparticles through X-ray diffraction, electron microscopy and evaluation of bactericidal properties ", *Saudi Journal of Biological Sciences,* vol. 22, pp. 637-644, 2015.

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